UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

FOIA 84-126

Docket No: 50-412

JUL 10 1984

MEMORANDUM FOR: Thomas M. Novak, Assistant Director
for Licensing, DL

FROM: Daniel R. Muller, Assistant Director
for Radiation Protection, DSI

SUBJECT: SAFETY EVALUATION REPORT - BEAVER VALLEY
POWER STATION, UNIT 2

PLANT NAME: Beaver Valley 2
LICENSING STATE: OL
DOCKET NUMBER: 50-412
RESPONSIBLE BRANCH: LB #3, M. Ley, LPM
REVIEW STATUS: Continuing

The Radiation Protection Section of the Radiological Assessment Branch has reviewed the Beaver Valley Power Station Unit 2 (BVPS-2) Final Safety Analysis Report (FSAR) as submitted by the Applicant. This review encompasses Chapter 12 radiation protection/ALARA considerations of the FSAR through Amendment 6, dated April 27, 1984, and includes the Applicant's responses both to Q's 471.1-471.15 and to open and confirmatory issues.

Enclosed (Enclosure 1) is a Safety Evaluation Report (SER) based on the criteria of the Standard Review Plan (NUREG-0800), Chapter 12. Additional information utilized for the review includes applicant submittals of 2/15/84, 6/13/84 and a telecon on 5/18/84.

The applicant has provided satisfactory commitments to close out the only 2 remaining items as follows:

a. (#12 confirmatory) (Q471.14.6) - SER 12.2.1 - provide source description 7-9 months before fuel load.

b. (#95 open) (Q471.3) - SER 12.3.4.1 - file for a 10 CFR 70.24(a) exemption in September 1984.

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A site visit and additional licensee submittals resulted in an acceptable closeout of all open items and confirmatory items. SALP input based on a site visit, discussions with the licensee, and responses to open and confirmatory issues is also enclosed.

Daniel R. Muller, Assistant Director
for Radiation Protection
Division of Systems Integration

Attachment:
SER
BVPS SALP Input

cc: w/attachment
F. Congel
O. Lynch
R. Serbu
M. Ley
G. Knighton
M. Shanbaky (RI)

12 RADIATION PROTECTION

The staff has evaluated the proposed radiation protection program presented in FSAR Chapter 12 against the criteria set forth in the SRP (NUREG-0800). The radiation protection measures at Beaver Valley 2 are intended to ensure that internal and external radiation exposure to station personnel, contractors, and the general population as a result of station conditions, including anticipated operational occurrences, will be within applicable limits of 10 CFR 20, and will be as low as is reasonably achievable (ALARA).

The basis of the staff acceptance of the Beaver Valley 2 radiation protection program is that doses to personnel will be maintained within the limits of 10 CFR 20, "Standards for Protection Against Radiation." The applicant's radiation protection designs and program features are consistent with the guidelines of Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Exposures at Nuclear Power Stations Will be As Low As Is Reasonably Achievable." Some of the radiation protection measures which the applicant will use at Beaver Valley include: use of remote handling equipment; pipe trenches for radioactive piping; use of corrosion resistant materials; location of radiation components in separately shielded cubicles; and training of personnel in radiation protection. The applicant's use of these and other radiation protection features will help to ensure that occupational radiation exposures are maintained ALARA, both during plant operation and during decommissioning.

On the basis of its review of the Beaver Valley 2 FSAR, the staff has concluded that the radiation protection measures incorporated in the design will provide a reasonable assurance that occupational doses will be maintained ALARA and below the limits of 10 CFR 20. These radiation design features are consistent with the guidelines of Regulatory Guide 8.8.

12.1 Ensuring that Occupational Radiation Exposures Are ALARA

12.1.1 Policy Considerations

The applicant provides a management commitment to ensure that the Beaver Valley Unit 2 will be designed, constructed, and operated in a manner consistent with Regulatory Guide 8.8, 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable"; and 1.8, "Personnel Selection and Training" (Revision 1). The ALARA philosophy was applied during the initial design of the plant. Since then, experienced operating personnel of the applicant have continued to review, update, and modify the plant's design and construction based on exposure data and experience gained from operating nuclear power plants. This is done to ensure that occupational exposures will be kept as low as is reasonably achievable in accordance with Regulatory Guide 8.8 criteria. Therefore, the policy considerations are acceptable.

12.1.2 Design Considerations

The objective of the plant's radiation protection design is to maintain individual doses and total person-rem doses to plant workers (including construction workers) and to members of the general public, ALARA, and to maintain individual doses within the limits of 10 CFR 20. Within restricted areas, all plant sources of direct radiation and airborne radioactive contamination are considered in the staff review.

To reduce radiation exposure, the applicant has utilized feedback information obtained from plants currently operational and utilized guidance from Regulatory Guide 8.8. Some examples of design improvements directly attributed to experience and operation and following Regulatory Guide 8.8 are as follows:

(1) Equipment and personnel decontamination areas have been included in the layout.

(2) Concrete shield walls, floors and ceilings are painted to enhance decontamination in the event of spillage of radioactive material in the auxiliary building.

(3) To minimize radiation exposure to operating personnel, radioactive piping is routed behind shielding.

(4) Equipment and components requiring maintenance are located in low radiation areas.

(5) Systems that may become contaminated are designed with provisions for flushing or remote chemical cleaning.

(6) Equipment is located in accessible parts of cubicles; equipment frequently changed in whole or in part is readily accessible.

(7) Localized shielding or space and adequate structure for localized shielding are provided as part of the shielding design.

(8) Auxiliary building ventilation is designed to ensure control of airborne contaminants; airflow is typically from areas of lower potential for contamination to areas with a higher potential for contamination.

These design considerations conform with the guidelines of Regulatory Guide 8.8 and are acceptable.

12.1.3 Operational Considerations

The Beaver Valley 2 station operational considerations included the development of a radiological training program, a radiation zoning and access control system, and general guidelines for workers performing maintenance in high-radiation areas. These operational considerations ensure that operating and maintenance personnel follow specific plans and procedures in order to ensure that ALARA goals are achieved in the operation of the plant. Engineering controls for the protection of personnel have been identified. High-radiation-

exposure operations are carefully preplanned and carried out by personnel well trained in radiation protection and using proper equipment. During such maintenance activities, personnel are monitored for exposure to radiation and contamination. Upon completion of major maintenance jobs, a work debriefing is conducted, a critique prepared, and procedure improvement feedback obtained from supervisors. The results are used to make changes in future job procedures and techniques.

Station and utility management personnel will conduct periodic reviews of the BVPS radiation protection program to identify design, operational, and personnel problems in the radiation protection area. The station management will use the findings to recommend design modifications or changes in plant procedures. The operational considerations conform to Regulatory Guides 8.8 and 8.10 and are acceptable.

The staff concludes that the policy considerations, design considerations, and operational considerations at Beaver Valley 2 are adequate to ensure that occupational radiation exposures will be ALARA in accordance with Regulatory Guides 8.8 and 8.10 and are acceptable.

12.2 Radiation Sources

Section 12.2 of the FSAR describes the sources of contained and airborne radioactivity used as inputs for the dose assessment and for the design of the shielding and ventilation systems. The methods and bases used by the applicant to estimate the source terms are also described. Additional information on source terms in Chapter 11 was also reviewed.

12.2.1 Contained Sources and Airborne Radioactive Material Sources

Inside the containment during power operation, the greatest potential for personnel dose during operation results from nitrogen-16, noble gases, and neutrons. Outside the containment and after shutdown inside the containment, the primary sources of personnel exposure are fission products from fuel-clad defects and activation products, including activated corrosion products.

Almost all of the airborne radioactivity within the plant results from equipment leakage. The source terms are based on conservatively selected data from the Gale Code (NUREG-0017) and Stone and Webster Topical Report RP-8A. The coolant and corrosion activation product source terms are based on operating experience from reactors of similar design; allowances are included for the buildup of activated corrosion products. Neutron and prompt gamma source terms are based on reactor-core-physics calculations and operating experience from reactors of similar design. The source terms presented are comparable to estimates by other applicants and are acceptable.

The applicant has provided a tabulation of maximum expected radioactive airborne concentration in equipment cubicles, corridors, and operating areas, from equipment leakage. The bases for these leakage calculations are in accordance with Regulatory Guide 1.112, "Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Light-Water-Cooled Power Reactors," and are acceptable.

The ventilation system will be designed to provide enough volume changes per hour in occupied areas that may contain significant airborne activity to maintain exposure to plant personnel ALARA. Air will be routed from areas of low potential airborne contamination to areas of increasing potential airborne contamination. The resulting estimated airborne radioactivity concentrations in frequently occupied areas will be a small fraction of 10 CFR 20.103 limits and are acceptable. The source terms used to develop these airborne concentration values are comparable to estimates by other applicants with similar design and are acceptable.

12.3 Radiation Protection Design Features

Section 12.3 of the FSAR describes the features that are included in the radiation protection design of the plant to maintain exposures ALARA. Separate descriptions are presented for the categories of facility design features, shielding, ventilation, and area-radiation and airborne radioactivity monitoring instrumentation.

12.3.1 Facility Design Features

The applicant has provided evidence that the dose-accumulating functions performed by workers have been considered in the plant design. Features have been included in the design to help maintain exposure ALARA in the performance of those functions. These features will facilitate access to work areas, reduce or allow the reduction of source intensity, reduce the time required in the radiation fields, and provide for portable shielding and remote handling tools. The applicant's facility design features are consistent with the guidance of Regulatory Guide 8.8. Therefore, the staff concludes that the facility design features are acceptable.

The applicant has provided five major radiation zones as a basis for classifying occupancy and access restrictions for various areas within the plant. On this basis, maximum design dose rates are established for each zone and used as input for shielding of the respective zones. The areas that will have to be occupied on a predictable basis during normal operations and anticipated occurrences are zoned so that exposures are below the limits of 10 CFR 20, and will be ALARA. The zoning sytem and access control features will also meet the posting and entry requirements of 10 CFR 20.203 and are consistent with Regulatory Guide 8.8.

Several features are included in the plant design and operational program to minimize the buildup of activated corrosion products, a major contributor to occupational doses.

Examples include:

(1) Interior surfaces as well as layout of ducts and pipes are designed to minimize buildup of contamination.

(2) Valves, valve packing, and gaskets are selected to minimize leakage and spillage of radioactive materials.

(3) Curbs, dikes, and controlled floor drains are provided around radioactive tanks to control leakage and minimize the spread of contamination.

(4) Systems subject to contamination include provisions for flushing or remote chemical cleaning prior to maintenance.

(5) Chemistry in the primary system is controlled.

(6) Cobalt bearing materals are minimized and used only as necessary for reliability and wear considerations.

The applicant's corrosion product control features are consistent with the guidance of Regulatory Guide 8.8 and are acceptable.

The design features incorporated by the applicant for maintaining occupational radiation doses ALARA during plant operation and maintenance will also serve to maintain radiation doses ALARA during decommissioning operations and are, therefore, acceptable.

12.3.2 Shielding

The objectives of the plant's radiation shielding are to provide protection against radiation for operating personnel, both inside and outside the plant, and for the general public, during normal operation, including anticipated occupational occurrences and during reactor accidents. The shielding was designed to meet the requirements of the radiation dose rate zone system discussed above. The following are several of the shielding design features incorporated into Beaver Valley 2:

(1) Access labyrinths are provided for rooms housing equipment that contains high radiation sources to preclude a direct-radiation path from the equipment to accessible areas.

(2) Radioactive piping is routed through high-radiation areas where practical, or in shielded pipe chases in low-radiation areas.

(3) Shielding is provided for all equipment which is anticipated to be normally radioactive.

(4) Piping penetrations, ducts, and voids in radiation shield walls are located to preclude the possibility of streaming from a high to a low radiation area.

(5) Shielding is designed to be removable where required, to provide personnel access for inspection, servicing, maintenance, or replacement of plant equipment.

These shielding techniques are designed to maintain personnel radiation exposure ALARA. Therefore, the staff concludes that the shielding design objectives are acceptable.

The applicant's shielding design methods included the use of computer codes such as GAMTRAN1, QADMOD, ANISD, COHORT II, and other standard source material. The applicant also used shielding information from operating nuclear plants as input data for his shield design calculations. All concrete shielding in the plant will be constructed in general compliance with Regulatory Guide 1.69, "Concrete Radiation Shields for Nuclear Power Plants." Therefore, the staff concludes that the shielding design methodology presented is acceptable.

In accordance with the criteria of Item II.B.2, NUREG-0737, "Clarification of TMI Action Plan Requirements," the applicant has performed a design review of station shielding to allow access to vital plant areas after an accident.

Dose rate calculations were performed for the locales of these areas by using the source terms and criteria of NUREG-0737. The radiation environment was evaluated at increments from 0 to 720 hours following the reactor shutdown following a LOCA with significant core damage. Dose rate zone maps were provided for each relevant area, as well as primary and alternate access routes to vital areas.

Vital areas requiring accessibility following an accident are identified with respect to location, occupancy requirements, and maximum dose levels. Vital areas include: the control room; emergency response facility; security building; hydrogen analyzers; post-accident sampling area; hydrogen recombiner cubicle; safeguards building manual valve station; RHR suction valve transfer area in the cable vault area; service building electrical connection area; and main intake structure. The shielding design review conducted by the applicant showed that the GDC 19 criterion is met by Beaver Valley 2 for vital areas requiring extended or continuous occupancy (the control room, the emergency response facility, and the security building). Additionally, GDC 19 limits are met for those vital areas requiring only infrequent access.

On the basis of its review, the staff has concluded that the applicant has performed a radiation and shielding design review for vital areas access in accordance with Item II.B.2 of NUREG-0737.

12.3.3 Ventilation

The ventilation system at Beaver Valley 2 will be designed to ensure that plant personnel are not inadvertently exposed to airborne contaminants exceeding those levels given in 10 CFR 20.103. The applicant intends to maintain personnel exposures ALARA by:

(1) maintaining airflow from areas of potentially low airborne contamination to areas of higher potential concentrations;

(2) ensuring negative or positive pressures to prevent exfiltration or infiltration of potential contaminants, respectively;

(3) controlling airborne radioactivity when normal airflow patterns may be disrupted, such as during maintenance.

These design criteria are in accordance with the guidelines of Regulatory Guides 8.8 and 1.52. Some examples of exposure reduction features in the ventilation system are:

(1) Shielding is provided as necessary around each filter train.

(2) Permanent test fittings are provided to facilitate routine testing.

(3) Adequate maintenance space, access, lighting, and changeout features are provided to facilitate maintenance and inspection.

The staff concludes that the applicant's ventilation system will keep personnel exposure at a small fraction of 10 CFR 20 values and is therefore acceptable.

12.3.4 Area Radiation and Airborne Radioactivity Monitoring Instrumentation

12.3.4.1 Area Radiation Monitoring Instrumentation

The applicant's area radiation monitoring system is designed to:

(1) provide operating personnel with an indication and record of gamma radiation levels at selected locations within the varous plant buildings;

(2) provide local alarms at key points where a substantial change in radiation levels might be of immediate importance to personnel frequenting the area;

(3) provide a continuous record of radiation levels at key locations throughout the plant.

To meet these objectives, the applicant plans to use 32 radiation monitors in 14 areas where personnel may be present and where radiation levels could become significant. Containment high range radiation monitors will be installed in accordance with our positions in NUREG-0737, Item II.F.1(3). Each area radiation monitor will be equipped with local audible and visual alarms, variable alarm setpoints, and a local readout device.

The applicant has provided area radiation monitors around the fuel storage areas in lieu of criticality monitors which meet the particular requirements

of 10 CFR 70.24 and the related guidance of Regulatory Guide 8.12, "Criticality Accident Alarm Systems," however. The applicant will file for an exemption from 10 CFR 70.24(a) by September 1984, and has provided a discussion of equivalent alternative monitoring methods which are acceptable to the staff until an exemption request is approved. The alternative methods discussed which preclude the need for a dedicated criticality monitor include geometric spacing of fuel, criticality analyses of fuel storage, limit switches restricting fuel movement, procedures which govern fuel storage and movement, and the use of reliable area radiation monitors which are routinely calibrated and maintained.

On the basis of our review, the staff concludes that the applicant's area radiation monitoring system will be acceptable.

12.3.4.2 Airborne Radioactivity Monitoring Instrumentation

The design objectives of the applicant's airborne radioactivity monitoring system are:

(1) to assist in maintaining occupational radiation exposure to airborne contaminants ALARA;

(2) to inform operating personnel of airborne radioactivity levels in plant areas and ventilation effluent streams;

(3) to ensure that abnormal release of airborne radioactivity is promptly detected.

The applicant will install airborne radioactivity monitoring systems (RMS) in work areas where there is a potential for airborne radioactivity. Visual and audible alarms are provided in the main control room for these monitors. The RMS airborne monitors have the capability to detect 10 MPC-hours of particulate and iodine radioactivity in any compartment that has a possibility of containing airborne radioactivity and that may be occupied by personnel. The applicant will provide portable continuous air monitors when needed to monitor air in

areas not provided with fixed airborne radioactivity monitors. Airborne radioactivity monitors will be calibrated at regular time intervals as required in Technical Specifications.

The objective and location criteria for Beaver Valley 2 station and airborne radiation monitoring systems are in conformance with 10 CFR 20 and Regulatory Guides 8.2 and 8.8 and are acceptable.

The staff concludes that the equipment and facility design features, shielding, ventilation, area radiation monitoring, and airborne radioactivity monitoring systems at Beaver Valley 2 are sufficient to ensure that radiation exposures are ALARA, and are acceptable.

12.4 Dose Assessment

The applicant has based its estimate of annual person-rem exposure on experience from currently operating reactors, Beaver Valley 1 operating experience, and the manner in which its own station has been designed and will be operated. It has performed an assessment of the dose in agreement with Regulatory Guide 8.19. The assessment considers doses that will be received by plant and contractor personnel based on occupancy factors in zones to be occupied, the dose rates in these zones, estimates of occupancy times, and the manpower necessary to perform the various tasks involved in plant operations. The annual collective dose equivalent is expected to be on the order of 450 person-rems per unit. Currently operating PWRs average 440 person-rems per unit annually, with particular plants experiencing an average lifetime annual dose as high as 1300 person-rems. These dose averages are based on widely varying yearly doses at PWRs. Long-term exposures should not exceed this value significantly. The basis for this estimate is associated with detailed dose estimates of specific tasks for the following work functions: reactor operations and surveillance, routine maintenance (normal and refueling operations), inservice inspection, special maintenance (e.g., steam generator maintenance, reactor coolant pump seal inspection and repair), waste processing and refueling. (Over the 5½ year construction period for Unit 2, doses to construction workers will total about 33.5 man-rem.) The applicant will

control doses through a formal ALARA program which has already been effectively applied at Beaver Valley Unit 1. The doses expected from normal operations are detailed in Table 12.4-1 through 12.4-10 of the FSAR and are consistent with operational experience at other operating pressurized water plants. Anticipated doses for maintenance and inservice inspection reflect current experience, such as steam generator inspection and repair, at a level consistent with effective operational practices, good chemistry controls, and ALARA work planning and conduct. For abnormal occurrences, the applicant has evaluated post-accident dose rates and doses for areas which are considered vital to post-accident control and recovery, and determined that occupancy and access for these areas will be below General Design Criteria 19 dose criteria. Special systems and procedures which enable ALARA doses for post-accident activities have been designed and developed for Beaver Valley 2. The applicant's exposure estimates are consistent with Regulatory Guides 8.10 and 8.19 and the staff's ALARA policy and we therefore find them acceptable.

12.5 Operational Radiation Protection Program

FSAR Section 12.5 describes the applicant's health physics program. The description includes the radiation protection organization, equipment, instrumentation, facilities and the procedures for radiation protection. Additional information on the station's organization is described in Chapter 13 of the FSAR.

The health physics program objectives are to provide reasonable assurance that the limits of 10 CFR 20 are not exceeded, to further reduce unavoidable exposures, and to ensure that individual and cumulative occupational radiation exposures are maintained ALARA.

12.5.1 Organization

The Radiological Operations Coordinator (ROC) is the Radiation Protection Manager (RPM) at Beaver Valley, and is responsible for the coordination, administration, and implementation of the plant's health physics program. The overall responsibility for the health physics program lies with the Vice

President, Nuclear Division. A radiation protection staff member is assigned to the station's Onsite Safety Committee. The applicant has committed that individuals assigned as the backup to the RPM, if the RPM is absent from the station, will meet our positions in NUREG-0731.

The Beaver Valley 2 radiation protection organization has been evaluated in accordance with the posistion of NUREG-0731, "Criteria for Utility Management and Technical Organization," and Regulatory Guide 8.8 (Section C.1.b(2),(3)).

The paragraphs below present an evaluation of how the health physics organization for Beaver Valley compares with the various staff positions concerning plant organization and management criteria.

(1) The organizational description for Beaver Valley 2 shows that the ROC reports offsite to the Manager, Nuclear Safety and Licensing and is independent of operations. The ROC does have access to the Station Superintendent and has effective access to the onsite plant manager - Manager, Nuclear Operations. The organization meets our positions for independence from operations in NUREG-0731 and Regulatory Guide 8.8 and is acceptable.

(2) The applicant has shown that the ROC meets the positions of Regulatory Guide 1.8, "Personnel Selection and Training," for RPM and is acceptable.

(3) The backup to the RPM during his absence from the station will be selected by the Manager, Nuclear Safety and Licensing, or his designee. The applicant has committed to using the criteria of ANSI 3.1, December 1979 draft, in selecting the individual temporarily filling the RPM position. This meets our positions in NUREG-0731 and is acceptable.

(4) The applicant has committed to having at least one Rad/Chem technician on site at all times. This satisfies the positions of NUREG-0731 and is acceptable.

The applicant has shown that the current health physics organization meets staff criteria as stated in NUREG-0731 and Regulatory Guide 8.8 for an acceptable radiation protection organization.

12.5.2 Equipment, Instrumentation, and Facilities

The radiation protection features at Beaver Valley 2 include a health physics laboratory, radiochemistry laboratory, decontamination facility, and a change area. These facilities are sufficient to maintain occupational radiation exposure ALARA and are consistent with the provisions of Regulatory Guide 8.8. Equipment to be used for radiation protection purposes includes portable radiation survey instruments, personnel monitoring equipment, fixed and portable area and airborne radioactivity monitors, laboratory equipment, air samplers, respiratory protective equipment, and protective clothing. The numbers and types of survey equipment, the sensitivity and range, and details of calibration have been described by the applicant to include the current Unit 1 inventory in detail as well as the general equipment intended for Unit 2. Based on the applicant's descriptions for Unit 1 in this area, we find the implementation of a similar program at Unit 2 acceptable.

In order to meet the criteria of III.D.3.3. of NUREG-0737, the applicant has committed to provide the equipment, training, and procedures to sample and determine postaccident airborne radioiodine concentrations by using portable air samples and charcoal or silver zeolite sampling mediums. Low background counting facilities for postaccident analyses will be provided. The postaccident radioiodine sampling and analyses provisions described for Beaver Valley 2 meet the staff's positions in Item III.D.3.3 of NUREG-0737 and are acceptable.

12.5.3 Procedures

All personnel entering controlled radiation areas will be assigned thermoluminescent dosimeter (TLD) badges and self-reading pocket dosimeters. The TLDs will be processed on a routine basis.

Special neutron surveys will be conducted and neutron TLDs will be provided in accordance with RG 8.14 when plant personnel enter neutron areas, as required by 10 CFR 20. Bioassay counts of all plant personnel exposed to radiation will be conducted on an annual basis. Other bioassays will be provided when deemed necessary by the plant's health physics staff, using the guidance of Regulatory Guides 8.9 and 8.26. All radiation exposure information will be processed and recorded in accordance with 10 CFR 20.

Developmental and technical training is provided for health physics professionals. Initial training, requalification and retraining programs are utilized for the radiation protection staff. Radiation protection training for plant staff and contractor meets our positions for compliance with 10 CFR 19.12.

Maintenance, repair, surveillance, and refueling procedures and methods used by the applicant are reviewed to ensure that all plant radiation protection procedures, practices, and criteria have been considered, to ensure that occupational radiation exposures will be ALARA and in accordance with Regulatory Guide 8.8.

Quality assurance requirements related to radiation protection will be implemented at Beaver Valley 2 in accordance with Regulatory Guide 1.33, "Quality Assurance Program Requirements."

Based on the information presented in the FSAR, a site visit, and the applicant's responses to the staff's questions, the staff concludes that the applicant intends to implement a radiation protection program that will maintain inplant radiation exposures within the applicable limits of 10 CFR Part 20 and will maintain exposures ALARA in accordance with Regulatory Guide 8.8.

RADIOLOGICAL ASSESSMENT BRANCH - SALP INPUT

PLANT: BEAVER VALLEY POWER STATION, UNIT 2
(SAFETY EVALUATION REPORT)

A. Functional Areas: Licensing Activities

1. Management involvement in assuring quality.

Reviews, based on responses to Q's and draft SER items, were generally timely, thorough and technically sound. Several matters took two or three efforts to achieve resolution since appropriate personnel were not made available to respond to staff questions.

Rating: 2

2. Approach to resolution of technical issues from a safety standpoint.

For most issues, the licensee's responses were technically sound and thorough, and showed a clear understanding of the technical issues. For administrative issues, viable approaches were offered, but these generally lacked thoroughness and depth and demonstrated an unwillingness to describe or commit to programs which are not required, but which enhance safety in radiation protection.

Rating: 2

3. Responsive to NRC initiatives.

Several issues took repeated efforts to obtain acceptable resolution. A meeting with the licensee was requested primarily to meet with the plant radiation protection manager for interview and clarification of open items, however, the RPM was not available for this meeting (a site visit), and an additional teleconference had to be arranged to close out several issues, including some generated by the lack of perspective on the part of licensee attendees at the meeting. In view of the planning time available and the clarity of the staff's request, the licensee did not adequately respond to staff needs in this area.

Rating: 3

4. Staffing (including management).

Not Reviewed

Rating: N/A

5. Reporting and analysis of reportable events.
   Not Reviewed

Rating: N/A

6. Training and qualification effectiveness.
   The licensee has a well-defined and implemented radiation protection training program with more than adequate resources. Virtually all site personnel receive this training.

Rating: 1

7. Overall Rating for Licensing Activity Functional Area: 2

B. Other Functional Areas (e.g. radiological controls, refueling)

1. RADIOLOGICAL CONTROLS
   The licensee has made a systematic effort to upgrade the design and facilities related to radiation protection at Beaver Valley 2. The program is generally sound and comprehensive, and is based primarily on the successful BV-1 radiation protection program. Several improvements at BV-2 which were intended to reduce occupational doses to workers were noted during the plant tour.

Rating: 2