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      STN-50-530 Palo Verde Nuclear Station, Unit 3, Arizona Publi   05000530
  AUTH.NAME   AUTHOR AFFILIATION
VAN BRUNT,E.E.   Arizona Public Service Co.
  RECIP.NAME   RECIPIENT AFFILIATION
KNIGHTON,G.   Licensing Branch 3

SUBJECT: Notifies that primary computer sys installed/tested & made
         functional for post-accident dose assessment during
         emergency,per License Condition 2.C(11)(d).Justification
         for computer choice encl.

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Director of Nuclear Reactor Regulation
Attention: Mr. George Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C.   20555

June 27, 1985
ANPP–32918–EEVB/MAJ

Subject: Palo Verde Nuclear Generating Station (PVNGS)
            Units 1, 2, and 3
            Docket Nos. STN-50-528(License No. NPF-41)/529/530
            License Condition 2.C(11)(d) – Post Accident Dose Assessment
            File: 85-056-026; G.1.01.10

References: 1)   Telecon between E. A. Licitra, NRR, R. Fish, NRC Region V,
                    and M. A. Jones, APS, on May 21, 1985 at 8:00 am.
                    Subject: NPF-34 License Condition 2.C(19)(g) – Post Accident
                    Dose Assessment.

             2)   Letter from E. E. Van Brunt, Jr., APS, to G. W. Knighton,
                    NRC, dated December 3, 1984. Subject: Emergency
                    Preparedness – Dose Assessment Capability (ANPP-31284).

Dear Mr. Knighton:

License Condition 2.C(11)(d) states,

        "By June 28, 1985, APS shall have installed, tested and made
        functional the primary system to be used for post accident dose
        assessment (the Chemical and Radiological Analysis Computer System
   or an alternate system which meets the NRC staff's requirements)."

In response to License Condition 2.C(11)(d), APS has installed, tested and
made functional the primary system to be used for satisfying the post accident
dose assessment requirements of 10CFR50.47 and Appendix E. The primary system
to be used at PVNGS for post accident dose assessment is an IBM Personal
Computer (PC) System utilizing a straight line gaussian model for offsite
dose calculations.

Additionally, the NRC has also requested per Reference (1), that APS submit
justification which supports the use of the IBM PC System in lieu of the previ-
ously described Chemical and Radiological Analysis Computer System (CRACS).
In response, Attachments 1 and 2 are provided for your review and information.
Attachment 1 provides a description of the IBM PC System and Attachment 2
provides a list of items which supports the use of the IBM PC System in place
of CRACS.

Another item of concern that was discussed in the Reference (1) telecon was
the fact that the IBM PC System only provides dose assessment within the 10
mile plume Emergency Planning Zone (EPZ).

A045
1|1
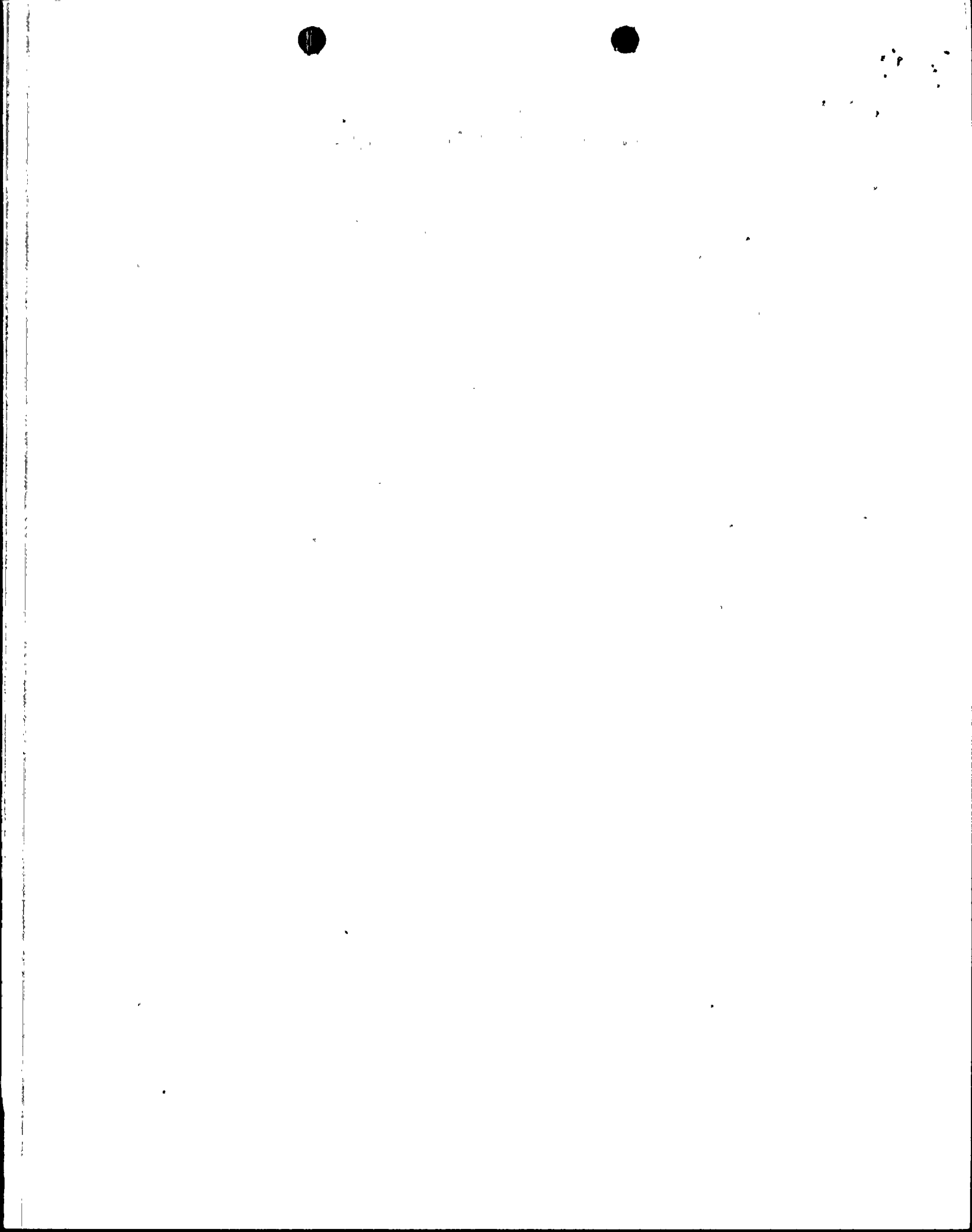
As recommended by NUREG-0654 (Revision 01), in declared emergencies the State
of Arizona specifies the emergency dose assessment and protective measures
to be used for the ingestion pathway. This responsibility is specified in
Annex B, Appendix 3 of the State of Arizona's Emergency Plan and is implemented
by the State and County.

If you have any questions on this subject, please contact William Quinn of
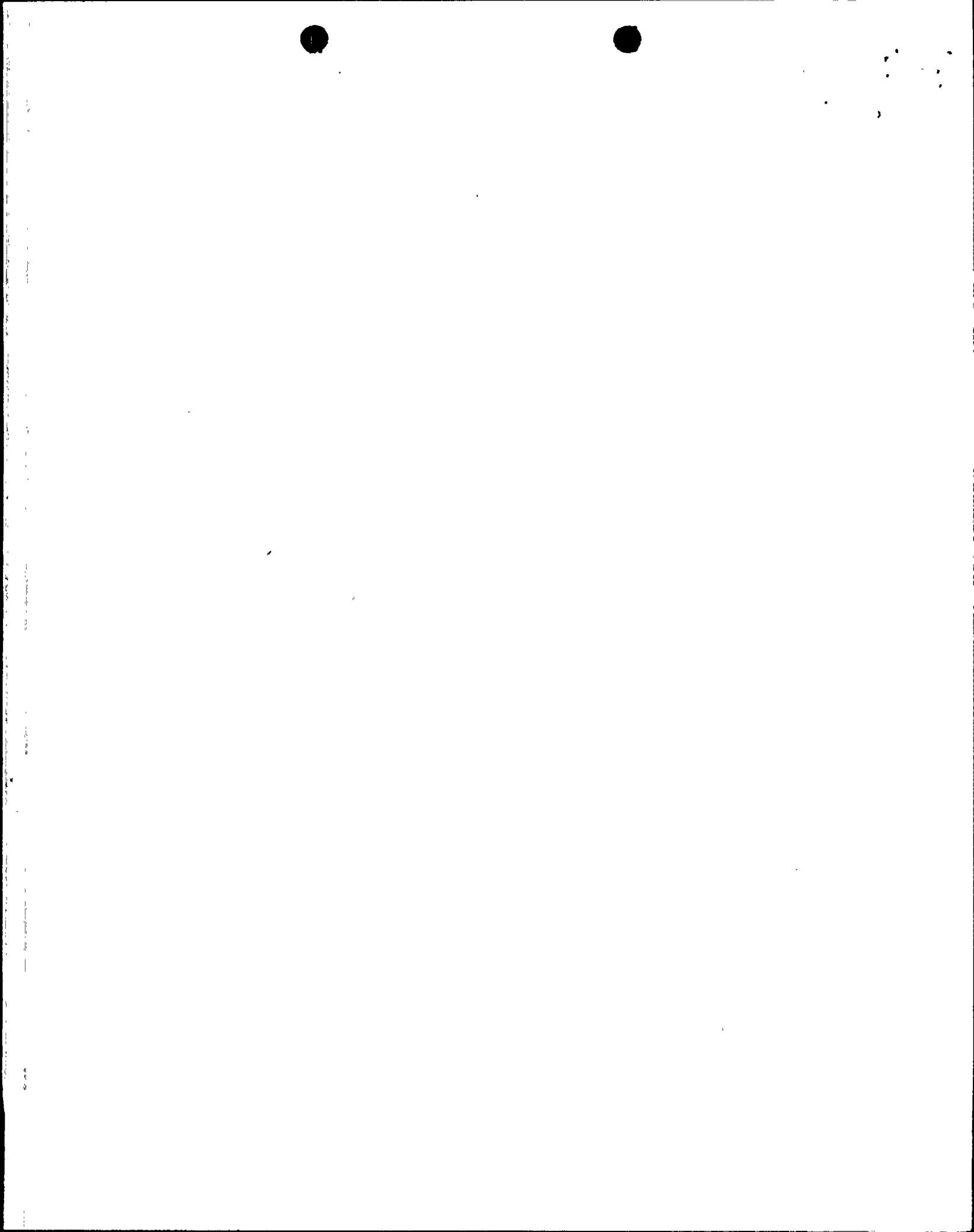my staff.

Very truly yours,

E. E. Van Brunt, Jr.
Executive Vice President
Project Director
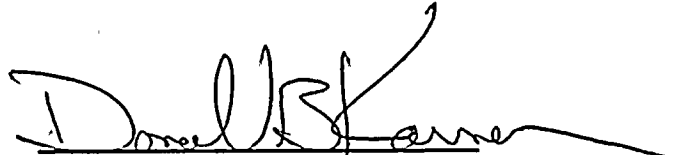
EEVB/MAJ/slh
Attachment

cc: A. C. Gehr   (all w/a)
      E. A. Licitra
      F. Kantor
      R. Zimmerman
      R. Fish, Region V

STATE OF ARIZONA   )
) ss.
COUNTY OF MARICOPA)

     I, Donald B. Karner, represent that I am Assistant Vice President, Nuclear Production of Arizona Nuclear Power Project, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.

                          Donald B. Karner

Sworn to before me this _27_ day of _June_ , 1985.

                          Notary Public

My Commission Expires:
My Commission Expires April 6, 1987

The IBM-PC "EPDOSE" program is a menu driven, user friendly automation of the manual calculations described in Emergency Plan Implementation Procedures (EPIP's) 14A "Release Rate Determination," 14B "Initial Dose Assessment" and 14C "Continuing Dose Assessment." The "EPDOSE" program implements these EPIP's in the following manner. Initially the program requests the appropriate data for current date and time, reactor shutdown date and time, and the type of calculation the computer operator desires. Current or projected dose assessment can be selected. The operator is then prompted for a series of inputs. The operator must first select whether plant conditions indicate 1% or 100% failed fuel. These two values determine which table of average energy values, based on effective age, should be used for iodine release rate determination and noble gas and iodine dose assessment. The operator is then prompted for wind speed, wind direction, stability class, release date and time and noble gas and iodine-131 release rates. If all this input data is available, the IBM-PC computer program carries out the dose rate calculations in the following fashion:

- Determines transit time to the receptor sites (site boundary, two, five, and ten miles) and effective age at the receptor sites.

- Determines relative dispersion (X/Q) values for receptor sites. A straight-line gaussian dispersion model with desert dispersion parameters is used for the X/Q calculation.

- Whole body dose rates and two hour projected doses are calculated using the average gamma decay energy (based on 1% or 100% failed fuel) and the effective age.

- Thyroid dose commitment rates and two hour projected dose commitments are calculated using a standard dose conversion factor approach corrected for effective age and 1% or 100% failed fuel.

If release rate information is not available, the program implements the release rate calculation methodology described in EPIP 14A. The effluent release point calculations are performed simply by obtaining the correct vent flow rates or default flow rates, and the noble gas concentration, and then multiplying by the effective age correction factors determined for the effluent monitors. Iodine-131 release rates are then determined using ratios of total iodine to noble gas and iodine-131 to total iodine relative release rates appropriate to the effective age. If a release is occurring through more than one effluent release point then these releases will be summed to yield a total release rate.

Release rate determination from the main steam system uses readings from the main steam line radiation monitors and effective age dependent monitor correction factors to calculate steam line concentration. The product of this concentration, the steam flow, and a steam density conversion factor yields a noble gas release rate. With the exception of an iodine removal factor, the iodine-131 release rate for the main steam system is then calculated in a manner identical to the vent pathway release methodology.

0175K/0010K

The final release rate projection calculated by the "EPDOSE" software uses containment area monitors and design basis leak rates to establish noble gas and iodine release rates. A nomograph, adapted from EPIP-14A, relates the indicated dose rate at either high range containment area monitor to the airborne concentrations of either noble gases or radioiodines in the containment building. Information usually obtained from the high range containment area monitors may be obtained by correlation to portable survey instrument readings external to containment and readings from other installed area radiation monitors for estimation of containment airborne concentration when the high range monitors are out of service. These correlations are not included in the "EPDOSE" software and must be performed manually in accordance with the instructions in EPIP-14A, "Release Rate Determination." Once the correlations are completed, the data can be entered onto the IBM PC. After the release pathways have been evaluated and release rates calculated, the program will then begin dose rate calculations as previously described.

The reports and dose calculations performed by the "EPDOSE" program were designed to give the users information to assist in making initial protective action recommendations. The program performs dose rate and two hour dose calculations, in the downwind direction, at the site boundary, two, five, and ten miles. This entire process takes approximately five minutes from initiation of the input process through hard copy output availability. In the actual dose calculation mode, the "EPDOSE" program also performs plume following based on input meteorological data. This feature is useful, especially with fluctuating wind direction, for graphically depicting the approximate location of the initial plume. A large screen printout complete with major roads, site boundary, two, five, and ten mile rings, and sectors, takes approximately three minutes to complete.
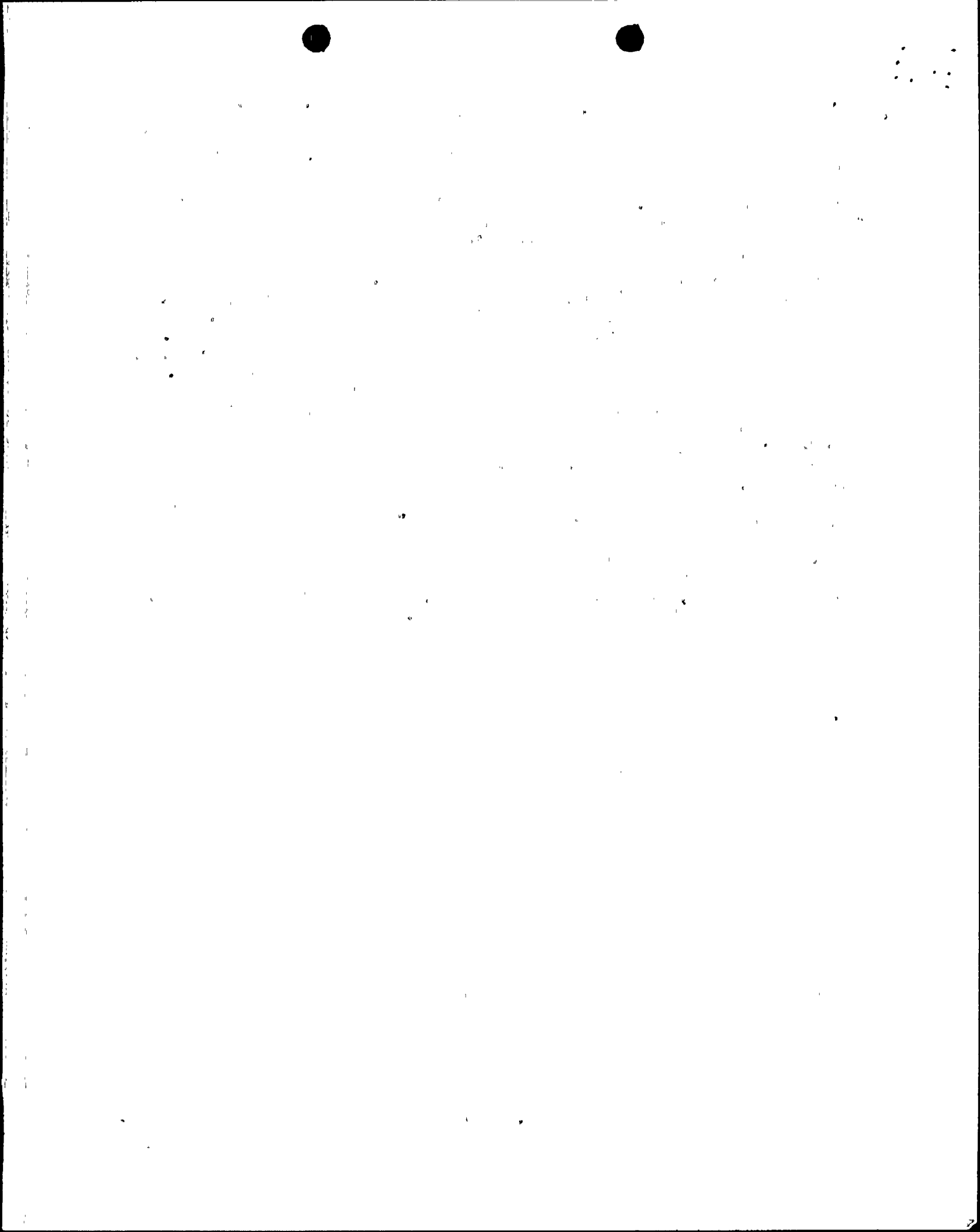
Basis for using the IBM PC System as the primary system of post accident dose assessment.

°   Meets the applicable post accident dose assessment requirements.

°   Has been successfully evaluated by NRC Region V during the last PVNGS Emergency Plan Exercise.

°   Does not decrease the effectiveness of the PVNGS Emergency Plan.

°   Is a very workable and easy system for the users to understand.

°   The IBM PC System and EPIP's have been modified to incorporate NRC comments on desert sigmas.