REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8705210465 DOC. DATE: 87/05/14 NOTARIZED: NO DOCKET #
FACIL: STN-50-528 Palo Verde Nuclear Station, Unit 1, Arizona Publi 05000528
AUTH. NAME AUTHOR AFFILIATION
HAYNES, J. G. Arizona Nuclear Power Project (formerly Arizona Public Serv
RECIP. NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Forwards addl info re util 870510 proposed emergency Tech Spec change re secondary sys liquid waste discharges to onsite evaporation pond, per 870512 telcon w/M. Licitra.

DISTRIBUTION CODE: A001D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6
TITLE: OR Submittal: General Distribution

NOTES: Standardized plant. M. Davis, NRR: 1Cy. 05000528

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD5 LA	1	0	PD5 PD	5	5
	LICITRA, E	1	1	DAVIS, M	1	1
INTERNAL:	ACRS	6	6	ARM/DAF/LFMB	1	0
	NRR/DEST/ADE	1	1	NRR/DEST/ADS	1	1
	NRR/DOEA/TSB	1	1	NRR/PMAS/ILRB	1	1
	OGC/HDS1	1	0	REG FILE 01	1	1
EXTERNAL:	EG&G BRUSKE, S	1	1	LPDR	1	1
	NRC PDR	1	1	NSIC	1	1
NOTES:		1	1			

Add: NRR/DREP/RPB

TOTAL NUMBER OF COPIES REQUIRED: LTTR ~~24~~ 27 ENCL ~~23~~ 24

Arizona Nuclear Power Project
P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

May 14, 1987
161-00212-JGH/DAL

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1
Docket No. STN 50-528 (License No. NPF-41)
Response to NRC Information Request Regarding
Proposed Emergency Technical Specification
Change - Secondary System Liquid Waste
Discharges to Onsite Evaporation Pond
File: 87-F-005-419.05; 87-056-026

Reference: (1) Letter to E. E. Van Brunt, Jr., ANPP, from E. A. Licitra, NRC, dated May 12, 1987. Subject: Request for Additional Information on License Amendment Request for Palo Verde Onsite Ponds (TAC No. 65290)

(2) Letter to USNRC (Document Control Desk) from E. E. Van Brunt, Jr., (ANPP) dated May 10, 1987 (161-00204)-EEVB/JRP). Subject: Proposed Emergency Technical Specification Change - Secondary System Liquid Waste Discharges to Onsite Evaporation Pond

Dear Sirs:

In a telephone call with M. Licitra (NRC) on May 12, 1987, ANPP was requested to provide some additional information regarding the referenced letter. This information request was forwarded to ANPP on May 13, 1987, by Reference 1. Our response to this information requested is attached.

Very truly yours,

J. G. Haynes
Vice President
Nuclear Production

JGH/DAL/ls
Attachment

cc: O. M. De Michele (all w/a)
E. E. Van Brunt, Jr.
G. W. Knighton
E. A. Licitra
R. P. Zimmerman
J. B. Martin
A. C. Gehr

A001 1/1 Add: JRR/DREP/RPB

Attachment to
161- 00212

ATTACHMENT 1

NRC QUESTION:

(1) For the postulated event discussed in the bases for Specification 3/4.11.1.1, provide the results of the analysis which demonstrates that the acceptance criteria for offsite exposure are met at any time during the life of the nuclear station. This analysis should assume that the concentration Sb-124 in the discharged waste water is at the requested activity level until March 31, 1988.

ANPP RESPONSE

As discussed in item E of the attachment to the referenced letter the addition of Antimony -124 to the evaporation pond over the period specified does not involve a significant reduction in the margin of safety, because the proposed change does not affect the design basis of the plant. The existing limits for concentrations of radioactive material discharged from secondary system liquid waste to the onsite evaporation ponds will remain at 5x10-7 uCi/ml for principal gamma emitters. Releases of Sb-124 may be allowed to exceed 5x10-7 uCi/ml but will be limited to 10 CFR 20, Appendix B, Table II, Column 2 concentration for the period of this Technical Specification (which expires at 2400 hours on March 31, 1988.) This will allow PVNGS to maintain a dose to the public of less than 500 mrem per year from accumulated particulates in the evaporation ponds after the three units have been operating for 40 years. Therefore, the contribution of Antimony to the post-40 year accident analysis dose would be negligible (less than 1 millirem per year/see Attachment 2) relative to the dose from the isotopes of the original analysis on which this Technical Specification is based. This is consistent with the design basis of the facility. A previous study of the evaporation pond requirements showed that the PVNGS ponds would not dry out during the 40 year plant life (Based on 65 inches per year evaporation rate-ref. FSAR 2.4.8.2.2 and 2.4.8.3). Therefore, wind deposition and resultant ground contamination does not occur. Flows to the existing pond will continue until no more pond space is available (19 ft depth). The ANPP recent forecast shows the current pond to be full by about March 28, 1988 (an additional pond is currently under construction). If flow to this existing pond ceased at the time of pond fill, complete pond evaporation would conservatively take about 3.5 years (no credit for reduced evaporation with increasing pond TDS concentration). The Sb-124 will have decayed away long before pond dry out, and no additional unrestricted area dose due to Sb-124 discharge would occur.

In addition the pond presently under construction is expected to be completed in the last quarter of 1987. Assuming a September 1 completion, with plant discharges directed to the new pond only, the existing pond will have filled to a depth of about 12 ft by September 1. Therefore, based upon the 65 inch per year evaporation rate, any remaining Sb-124 in the dried sludge would provide a negligible contribution to offsite dose. Again no wind deposition would occur since the pond will not dry up under this conservative assumption. At the same time the new pond depth will continue to rise, because the total unit input (including cooling tower blowdown) will exceed the evaporation rate.

For these reasons, it has been determined that the change does not involve a significant reduction in the margin of safety.

NRC QUESTION:

(2) Since the addition of Sb-124 to the onsite pond could represent a potential new release path for offsite exposure, discuss how Appendix I requirements are met for the proposed change to the Technical Specifications.

ANPP RESPONSE:

The response to Question 1 conservatively concluded that the ponds will not dry up during the period when Sb-124 is above the lower limit of detection (LLD). The Sb-124 being discharged to the pond occurs as a (dissolved) solid. This solid is left behind when evaporation takes place. Since the ponds will not dry out before LLD is reached, as previously discussed, there is no new release path created. No other release path will occur during the period when the Sb-124 is discharged to the pond and while Sb-124 is above the LLD.

Therefore, since no new release paths are available, there is no additional exposure or Appendix I impact created by this addition of Sb-124 to the pond. PVNGS will remain well within the Appendix I criteria.

Other potential release paths such as a pond liner failure or a pond dike failure are not considered in the bases to Technical Specification 3/4.11.1. These potential release paths are, however, bounded by the analysis described in FSAR Section 2.4.13.3.

Attachment to
161-00212

ATTACHMENT 2

Dose from standing on Antimony-124 accumulated in evaporation pond for 1 year.

Assumptions

Expected volumetric discharge flow rate of secondary wastes from Unit 1 to evaporation pond is 57,640 gallon/day.

Sb-124 concentration in this flow is 2E-05 μCi/ml

Case I

Discharge duration 292 days

Pond dryup time, $3\frac{1}{2}$ years or 1277 days

Case II

Discharge duration (5/24/87 to 9/1/87) 100 days

Pond dryup time, 2.2 years or 803 days.

Both cases

Surface area is 255 acres

255 acres x 4046 meter ^{2}/acre

= 1.03 E+06 meter^2

Calculation

Half life of Sb-124 is 60 days.

Decay constant = λ = .693/60 = 1.16 E-02 day $^{-1}$

Quantity accumulated at time of initial occupancy is:

(concentration)(flow rate)(buildup factor)(decay term)

Attachment to
161-00212

Case I

Quantity accumulated =

(2E-05 µCi/ml)(5.764 E+04 gallon/day)(3.785 E+03 ml/gallon)(1E+06 pCi/ µCi)

$(1/\lambda)(1-e^{-(1.16E-02)(292)})(e^{-(1.16E-02)(1277)})$

=(4.36E+09)(1-.03)(3.74E-07)(86.2)

1.36 E+05 pCi

Divided by surface area:

1.36E+05/1.03 E+06 = 1.3 E-01 pCi/meter^2

Times dose factor:

(1.3 E-01 pCi/meter^2)(9.8 E-09 mrem/hour/pCi/meter^2)

=1.3 E-09 mrem/hour

For one year:

(1.3E-09 mrem/hour)(8,760 hour/year) = 1.1E-05 mrem

Case II

Quantity accumulated =

$(2E-05)(5.764\ E+04)(3.785\ E+03)(1E+06)(1/1.16E-02)$

$(1 - e^{-(1.16\ E-02)(100)})(e^{-(1.16E-02)(803)})$

$=(4.36E+09)(86.2)(1 - e^{-1.16})(e^{-9.3})$

$= (3.76\ E+11)(1-.31)(9.14E-05)$

$= 2.37\ E+07$ pCi

Divided by surface area:

$2.37E+07/1.03E+06 = 23$ pCi/meter^2

Time dose factor:

(23 pCi/meter^2)(9.8E-09 mrem/hour/pCi/meter^2

$= 2.3\ E-07$ mrem/hour

For one year:

(2.3E-07 mrem/hour)(8,760 hour/year) = 2.0E-03 mrem