

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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 FACIL: STN-50-528 Palo Verde Nuclear Station, Unit 1, Arizona Publi 05000528  
 STN-50-529 Palo Verde Nuclear Station, Unit 2, Arizona Publi 05000529  
 STN-50-530 Palo Verde Nuclear Station, Unit 3, Arizona Publi 05000530  
 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 comments re written exams administered on 870410,  
 per P Morrill 870420 telcon. Comments previously discussed  
 on 870413 & are in addition to those submitted by 870416  
 ltr.

DISTRIBUTION CODE: M003D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 9  
 TITLE: Operator Requalification Program

NOTES: Standardized plant. M. Davis, NRR: 1Cy. 05000528  
 Standardized plant. M. Davis, NRR: 1Cy. 05000529  
 Standardized plant. M. Davis, NRR: 1Cy. 05000530

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD5 LA	1 0	PD5 PD	1 1
	LICITRA, E	1 1	DAVIS, M	1 1
INTERNAL:	ACRS	10 10	AEOD/DDA	1 1
	AEOD/DSP/TPAB	1 1	NRR/DLPQ/HFB	1 1
	NRR/DLPQ/OLB	1 1	<u>REC FILE</u> 01.	1 1
	RGN5	1 1		
EXTERNAL:	LPDR	1 1	NRC PDR	1 1
	NSIC	1 1		
NOTES:		1 1		

1. The following information was obtained from a confidential source who has provided reliable information in the past:

2. It is noted that the source has provided information concerning the activities of the above-named individual in the past.

3. The source has provided information concerning the activities of the above-named individual in the past.

4. It is noted that the source has provided information concerning the activities of the above-named individual in the past.

5. The source has provided information concerning the activities of the above-named individual in the past.

DATE	ACTIVITY	LOCATION	STATUS	REFERENCE
1/15/58	Met with [redacted]	[redacted]	[redacted]	[redacted]
1/20/58	Met with [redacted]	[redacted]	[redacted]	[redacted]
1/25/58	Met with [redacted]	[redacted]	[redacted]	[redacted]
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12/25/58	Met with [redacted]	[redacted]	[redacted]	[redacted]



## Arizona Nuclear Power Project

P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

April 22, 1987  
161-00166-JGH/PGN

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

Subject: Palo Verde Nuclear Generating Station (PVNGS)  
Units 1, 2, and 3  
Docket Nos. STN 50-528 (License NPF-41)  
STN 50-529 (License NPF-51)  
STN 50-530 (License NPF-65)  
Comments on Reactor Operator and Senior Reactor Operator  
Exams Administered on April 10, 1987  
File: 87-001-762; 87-A-056-026

Reference: Letter from J. G. Haynes (ANPP) dated April 16, 1987 (PP16100146).  
Subject: Comments on Reactor Operator and Senior Reactor Operator  
Exams Administered on April 10, 1987.

Dear Sir:

Per telephone conversation on April 20, 1987, Phil Morrill of the NRC Region V staff requested the attached comments on the NRC written examination administered on April 10, 1987 at PVNGS. These comments were previously discussed by Phil Morrill and William Rudolph of ANPP Training on April 13, 1987, and are in addition to those submitted by the referenced letter.

If you have any questions, please call Peggy Nelson at (602) 371-4252.

Very truly yours,

J. G. Haynes  
Vice President  
Nuclear Production

JGH/PGN/dlm  
Attachment

cc: O. M. De Michele (all w/a)  
E. E. Van Brunt, Jr.  
A. C. Gehr  
R. P. Zimmerman

J. B. Martin  
R. J. Pate  
P. J. Morrill

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MEMORANDUM FOR THE RECORD

TO: SAC, NEW YORK

FROM: SAC, NEW YORK

SUBJECT: [Illegible]

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ATTACHMENT

Comments on Reactor Operator Examination

Section 1

Question

Comment

1.08.a

Solution

$$CR_1 (1-K_1) = CR_2 (1-K_2)$$

$$\begin{aligned} \rho_1 = -6.4\% \quad \Delta K/K &= -6400 \text{ pcm} \\ &= -.06400 \quad \Delta K/K \end{aligned}$$

$$K_1 = \frac{1}{1-\rho_1} = \frac{1}{1-(-.064)} = .93985$$

$$(1-K_2) = \frac{5}{25} (1-.93985)$$

$$= .2 (.06015)$$

$$= .01203$$

$$-K_2 = .01203 - 1$$

$$K_2 = .98747$$

$$\rho_2 = \frac{K_2 - 1}{K_2} = -.01218$$

$$\begin{aligned} &= -1.22\% \quad \Delta K/K \end{aligned}$$

$$\begin{aligned} \text{Rod Worth} &= \rho_{\text{final}} - \rho_{\text{initial}} \\ &= -1.22 - (-6.4) \\ &= 5.18\% \quad \Delta K/K \end{aligned}$$

OR

$$\begin{aligned} CR_1 \rho_1 &= CR_2 \rho_2 \\ \rho_2 &= 5/25 (-6.4) \\ &= 1.28\% \quad \Delta K/K \end{aligned}$$

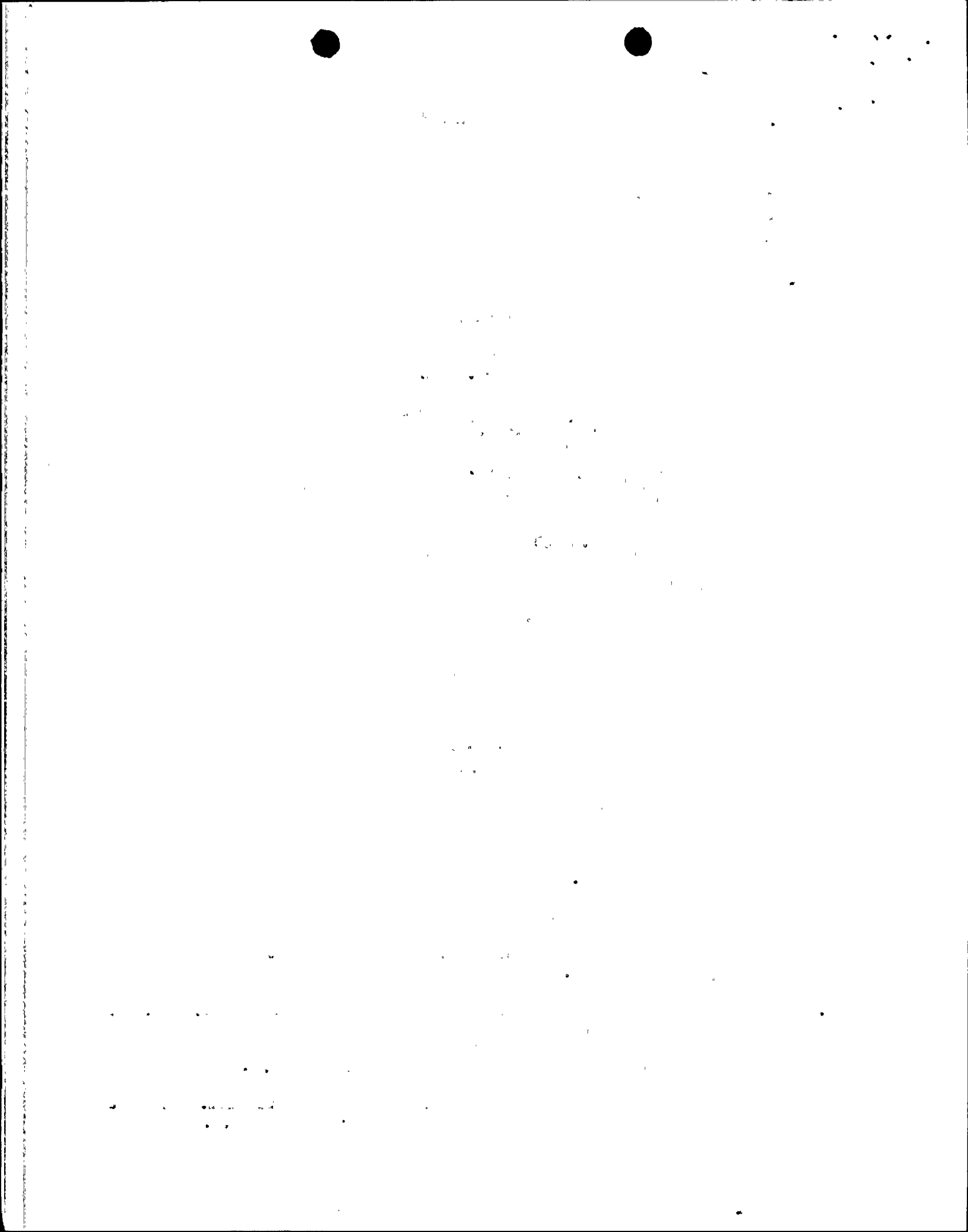
$$\text{Rod Worth} = 5.12\% \quad \Delta K/K$$

Both answers are close to key value of 5%  $\Delta K/K$  and should be accepted.

1.08.b

This value for shutdown margin violates PVNGS Technical Specifications (T.S.) and candidates may be confused. They may infer that "Shutdown Margin" refers to the actual amount shut down and give the answer as  $-1.22\% \Delta K/K$ .

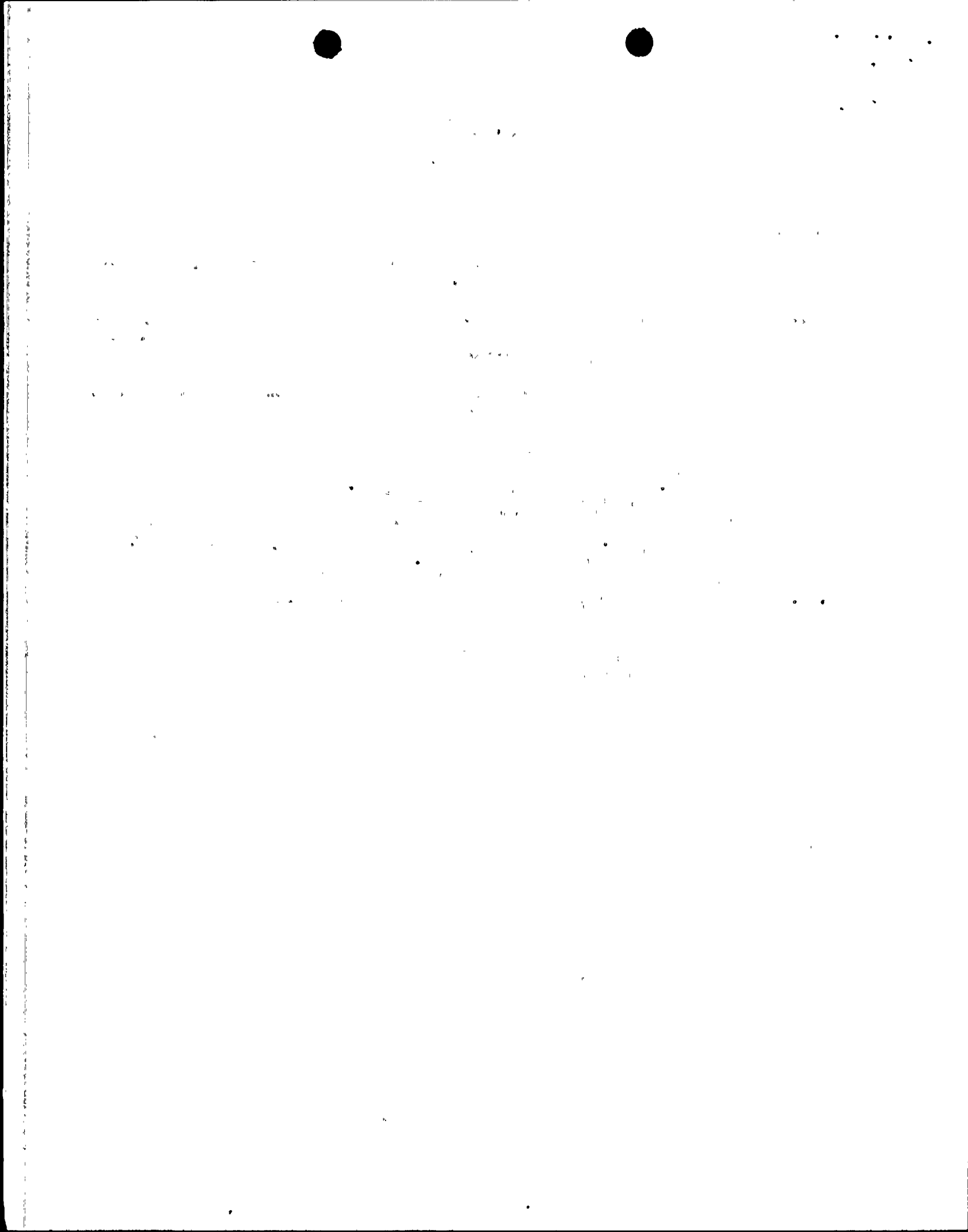
The numbers used have complicated the problem. Even the initial condition  $\rho_{\text{net}} = -6.4\% \Delta K/K$  violates T.S.



ATTACHMENT  
(Continued)

Section 2

<u>Question</u>	<u>Comment</u>
2.05	The two electrical systems are 125VDC and 120VAC power. See elementary 01-E-NNA-001.
2.07.c	Valves (UV-65 and UV-145) are manually opened by the operator, the valves do not open automatically on a LOP. See elementary C1-E-EWB-003.
2.09.b	Question asks for three systems that must be in operation. The systems required are:  <ol style="list-style-type: none"><li>1. Plant Cooling Water.</li><li>2. Gland Steam seals and drains.</li></ol> <p>The answer key had separated the second of these into two systems. This may confuse candidates trying to name three systems when only two exist.</p>
2.10.b	Turbine driven Auxiliary Feedwater Pump has two feed regulation valves.  HV-32 powered from PKA-M41 HV-33 powered from PKC-M43  Reference: PGS-15D page 10 PGS-11 page 16

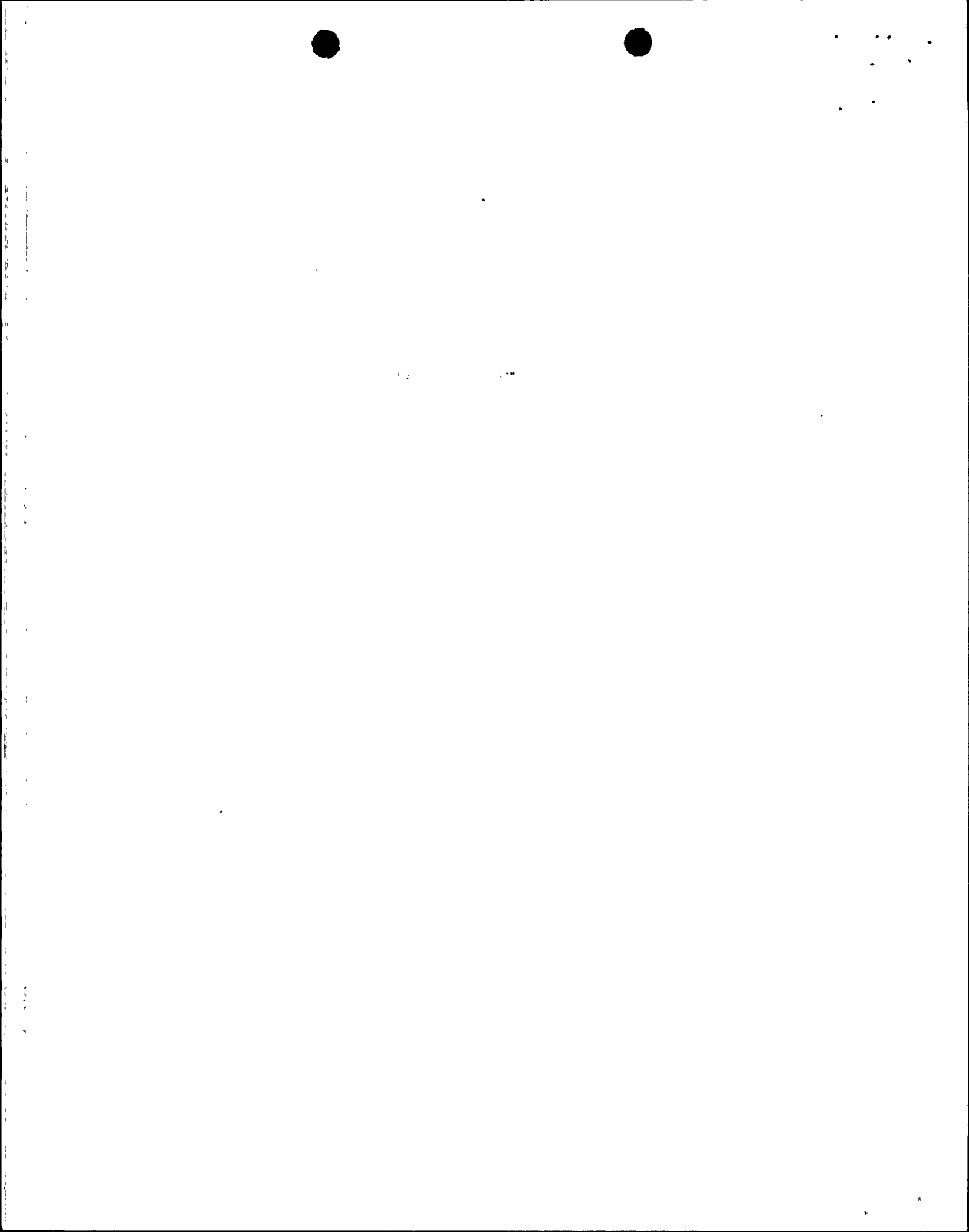




ATTACHMENT  
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Section 3

<u>Question</u>	<u>Comment</u>
3.02.c	RCP speed, rather than RCS flow, may be the response. RCP speed is the parameter measured to determine flow.
3.04	AWP is only generated on positive deviation of $T_{ave} - T_{ref} \geq +6^{\circ}F$ , not $\pm 6^{\circ}F$ . Reference: NS-9C-9, 26 and 27
3.06.b	Variable overpower trip setpoint:  Rate: 10.6%/min Ceiling: 110% Band: 9.8%  Reference: T.S. Table 2.2-1
3.07.a	Low RCS temperature following Reactor trip
3.07.b	Some plant conditions still affect SBCS:  1. Condenser interlock  2. Emergency off
3.09	Answer key implies there is a difference between backup and proportional heaters; both function off of the same bistable and both trip on high pressure and low level.



ATTACHMENT  
(Continued)

Section 4

Question

4.09

Comment

T.S. 3.4.5.2 lists RCS leakage as follows:

- a. No pressure boundary leakage
- b. 1 GPM unidentified leakage
- c. 1 GPM total primary to secondary through all S/Gs and 720 GPD through any one S/G
- d. 10 GPM identified leakage from RCS
- e. 1 GPM at RCS pressure of 2250 + 20 psia from any valve listed in T.S. Table 3.4-1

The answer of "10.2 gpm total leakage exceeds 10 gpm total leakage limit" is not an LCO. The actual LCO says 10 gpm identified leakage from RCS.

0.6 gpm leak in one S/G is not an LCO. LCO of 720 GPD will be exceeded if leak remains for 1 day.

The only LCO exceeded without some assumptions is "No pressure boundary leakage", by 0.2 GPM through the socket weld.

ATTACHMENT  
(Continued)

Comments on Senior Reactor Operator Examination

Section 5

<u>Question</u>	<u>Comment</u>
5.03.f	Any activity prevented due to Xenon negative reactivity exceeding available excess reactivity should be an acceptable definition for Xenon preclusion.
5.05	<p>Problem does not provide suction pressure. If a suction pressure is assumed, full credit should be given for a correct answer since pump delta pressure follows pump law, not discharge pressure.</p> <p>Example: Assume 5 psig suction pressure.</p> <p>delta P at 1800 RPM = 45 psi delta P at 1200 RPM = 45 psi * (.666)<sup>2</sup> = 20 psi Discharge Pressure at 1200 RPM = 20 + 5 psig = 25 psig</p>
5.09.a	<p>Question is vague. The value of power coefficient does not depend on RRS unless a power change (change in steam demand) occurs without compensating reactivity actions by the operator. If T<sub>ave</sub> differs from the programmed value for a given power level, then the power coefficient will change. The question does not lead the candidate to assume that T<sub>ave</sub> is going to differ.</p> <p>Example: Even if RRS is in manual, a power change can be [and usually is] accomplished by a change in RCS boron concentration and the power coefficient will not change.</p>
5.11	<p>Answer key subtracts losses to ambient. These should be added. Correct solution is:</p> $\begin{array}{r} 3692 \text{ MWt (Q)} \\ - 17 \text{ MWt (RCP)} \\ + 7 \text{ MWt (ambient losses)} \\ \hline 3682 \text{ MWt} \end{array}$

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TO: DIRECTOR, CENTRAL INTELLIGENCE AGENCY

FROM: SAC, [illegible]

SUBJECT: [illegible]

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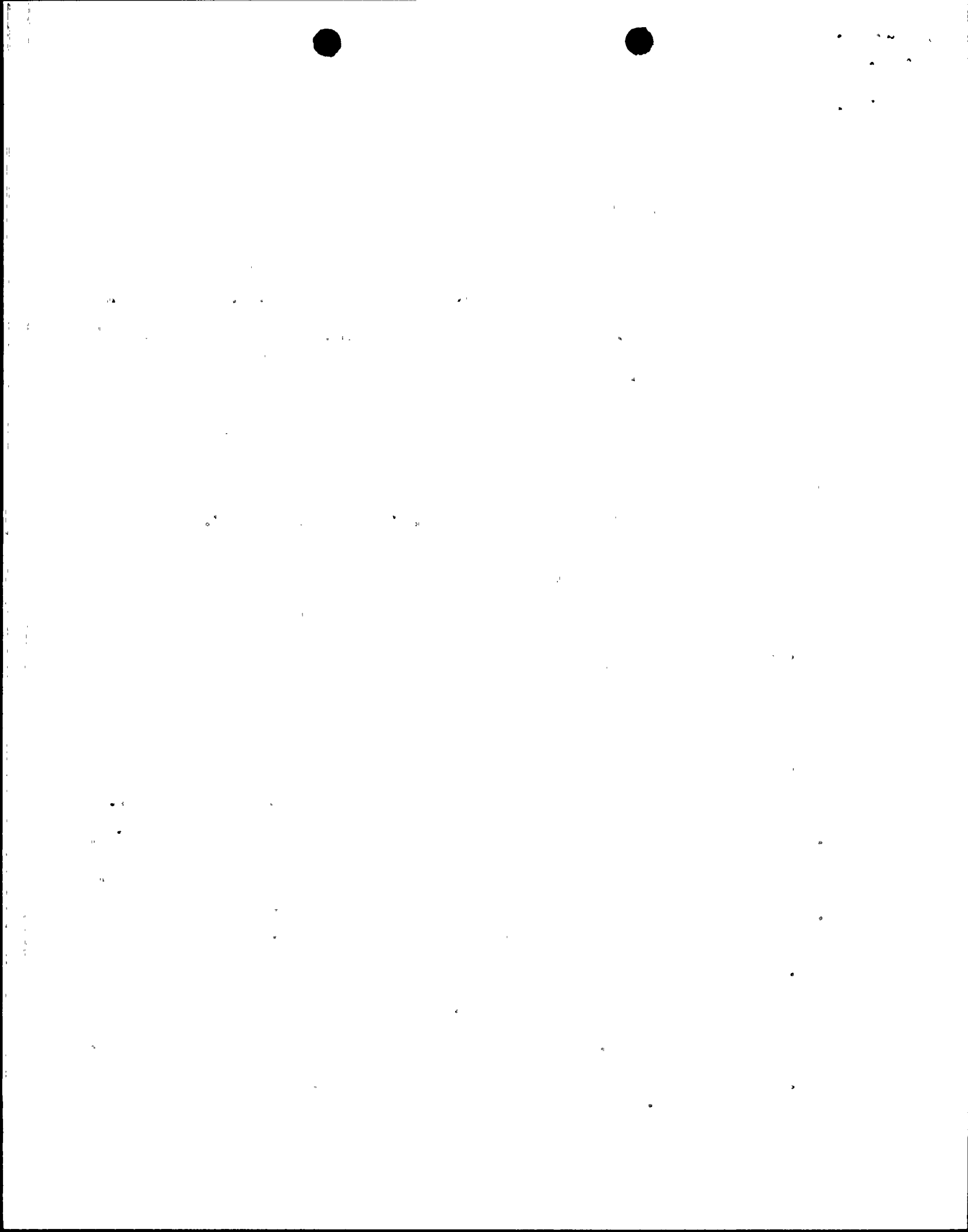
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Section 6

<u>Question</u>	<u>Comment</u>
6.02.b	The question is related to the Gaseous Radwaste System and N <sub>2</sub> is added to the Gaseous Radwaste System when high concentrations of oxygen are detected. Gases added to the VCT are H <sub>2</sub> to control oxygen concentrations in the RCS coolant and N <sub>2</sub> to purge H <sub>2</sub> gas during degassing operations in the RCS. Due to the confusion of part "b", request deletion of part "b" and that full credit be given for part "a" of the question.
6.03.a	CSAS signal will start the chillers in the same way SIAS does. This should be an acceptable answer. Reference: drawing J104-66 (or electrical 342-0100).
6.04.a	Different terminology should be accepted: <ol style="list-style-type: none"><li>1. "Select switch" may be "Mode select switch".</li><li>2. "CEA, tens and CEA, units" may be "individual CEA selected".</li><li>3. May mention that proper group must be selected.</li></ol>
6.05.a.1	"Peak linear heat rate" may also be worded "linear power density".
6.06.b.1	AWP is only generated on positive deviation of $T_{ave} - T_{ref} \geq + 6^{\circ}F$ . Reference: 01-J-SFE-053.
6.08.d	Correct answer is MSIS, but candidate may say that during the transient, AFAS-1 may occur, but would be eventually locked out due to the S/G 2 being greater than 185 psid from S/G 1.
6.12	Answer key does not list generator trips, only Diesel trips. Question asks for Diesel-Generator trips. All trips of Diesel and generator should be accepted as correct responses.
6.13.b	A "condenser interlock or emergency off" will inhibit the manual permissive. Reference: 01-J-SFE-058.
6.13.c	Loss of feedwater pump (not pumps).
6.15	Question is misleading. During normal operation air removal is not going "thru-filter", moisture would not normally be removed. The answer is correct as to the reason this is done.
6.16.b	A low level in the EW surge tank will also isolate EW from NC. Reference: 01-E-EWB-003.



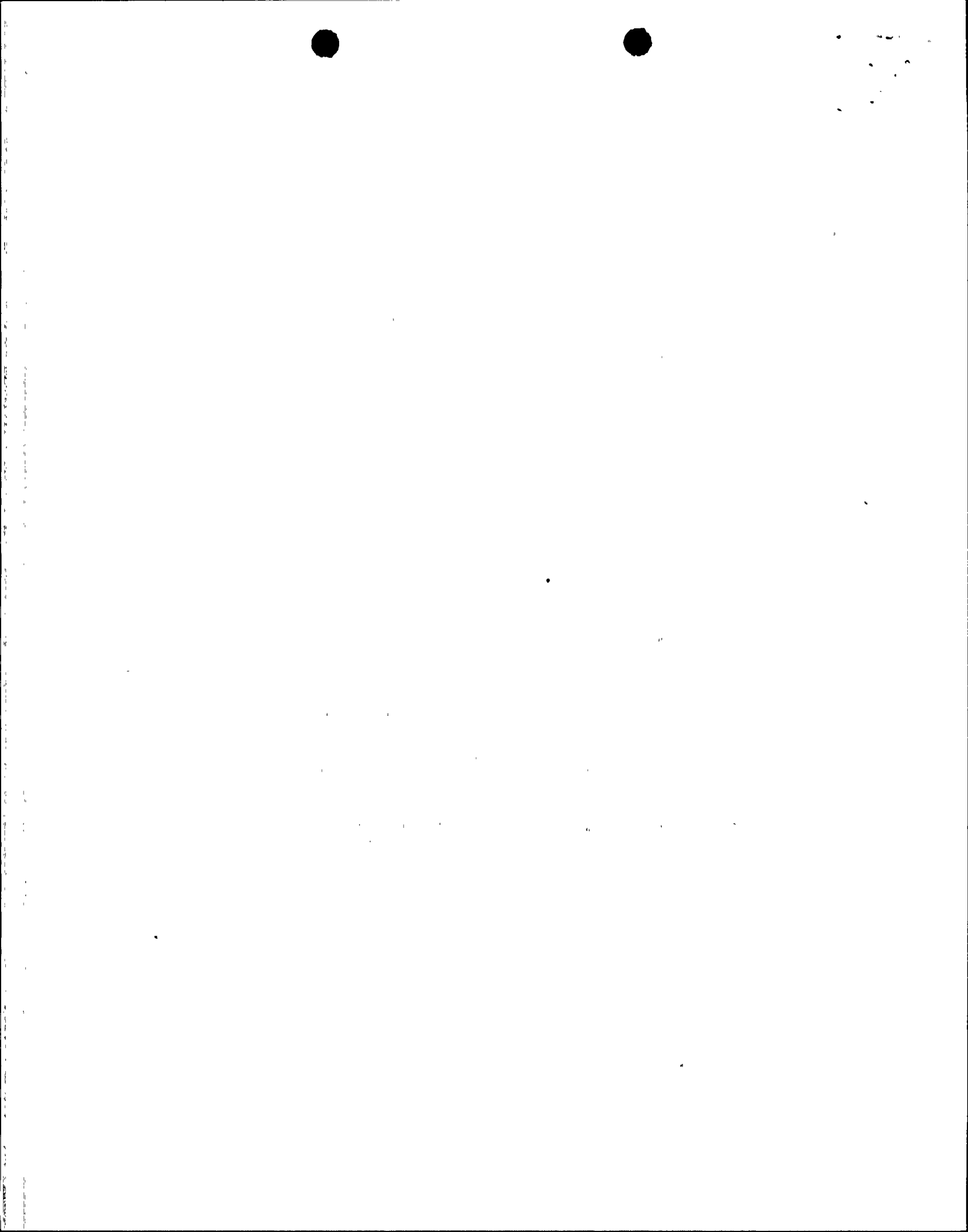
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Section 7

<u>Question</u>	<u>Comment</u>
7.04	Confusion may have occurred from areas being given by dose (mRem) instead of dose rate (mRem/hr).
7.10.b	Diesels are cooled by Essential Spray Pond Water.
7.12.b	On flow chart, pg. 2 of Appendix E, seven items are evaluated, not six. <ol style="list-style-type: none"><li>1. Th stable or decreasing</li><li>2. Tc stable or decreasing</li><li>3. Core <math>\Delta T</math> less than full power <math>\Delta T</math> of 57°F</li><li>4. CET's and Th trending consistently</li><li>5. RCS subcooled margin &gt; 28°F</li><li>6. RV outlet plenum full</li><li>7. RCS voiding suspected</li></ol>

We do not verify Tc at S/G T<sub>sat</sub> (#2 of answer key). #5 of original answer key not exactly correct since there are two 0-100% ranges on RVLMS. The plenum must indicate 100%.





ATTACHMENT  
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Section 8

Question

Comment

8.05

Question asks "What is the minimum Licensed Crew composition in accordance with T.S. 6.3.1 for operation in Mode 5". The T.S. lists an A.O. as part of the required crew. No points should be taken off if the A.O. is included in the answer.

END OF COMMENTS

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