"TEMPORARY CHANGE"

1001
Figure 1001-5

NOTE: Instructions and guidelines in AP 1001 must be followed when completing this form.

Three Mile Island Nuclear Station
Temporary Change Notice (TCN)

SIDE 1

TCN NO. 2-79-068 (From TCN Log Index)

Unit No. II

Date 3/14/79

1. Procedure 1022.2 (No.) RELEASING RAD GAS WASTE (Title)

2. Change (Include page numbers, paragraph numbers, and exact wording of change.)
SEE ATTACHED

3. Reason for Change:
HYDROGEN PURGE CLEAN-UP SYSTEM

4. Recommended by L. Lantz 3/14/79 (Date) 5. T. Mulleavy (Supervisor's Signature) 3/14/79 (Date)

6. Duration of TCN - No longer than ninety days from effective date of TCN or as in (a) or (b) below whichever occurs first.

(a) TCN will be cancelled by a procedure revision issued as a result of a Procedure Change Request to be submitted by L. Lantz (Supervisor Submitting TCN) (Submit PCR as soon as possible) ☑

(b) TCN is not valid after _____ (fill in circumstances which will result in TCN being cancelled) ☐

7. (a) Is the procedure on the Nuclear Safety Related Procedure List? (Sec. AP 1001 – Appendix B) If "Yes", complete Nuclear Safety Evaluation. (Side 2 of this Form) Yes ☑ No ☐

(b) Is the procedure on the Environmental Impact Procedure List? (Sec. AP 1001 – Appendix B) If "Yes", complete Environmental Evaluation. (Side 2 of this Form) Yes ☑ No ☐

(c) Does the change effect the intent of the original procedure? Yes ☐ No ☑

NOTE: If all answers are "no" the change may be approved by the Shift Supervisor. If question (c) is answered "yes", the change must be reviewed by the PORC and approval by the Station/Unit Superintendent prior to implementation. If the answer to question (c) is "no" the change may be approved by two members of the plant management staff at least one of whom holds a senior reactor operators license on the unit affected in accordance with paragraph 3.6.4.2 of AP 1001.

8. Review and Approval

Block (c) "yes"

Approved _____ (Shift Supervisor/Foreman) _____ (Date)

Reviewed _____ _____

Members _____ _____

Of PORC _____ _____

Contacted _____ (PORC Members) _____ (Date)

Approved _____ (Unit Superintendent) _____ (Date)

Block (c) "no"

Approved A Miller (SRO License) 3-14-79 (Date)

T. Mulleavy (Member Plant Mgt. Staff) 3-14-79 (Date)

Reviewed _____ (Chairman of PORC) _____ (Date)

Approved _____ (Unit Superintendent) _____ (Date)

NOTE: The block (c) "Yes" review and approval chain may be followed at anytime.

9. Approval
Manager, Generation Quality Assurance T. Mackey per telecon Date 3-14-79

NOTE: M.G.Q.A. approval required only on certain Administrative Procedures listed in Enclosure 7 of AP 1001

10. TCN is Cancelled _____ (Shift Supervisor/Shift Foreman) Date _____

206 054 7906150129 P

TMI-56 Rev. 8-77

"EVALUATION"

1001

Figure 1001-4

Three Mile Island Nuclear Station — **SIDE 2**

Nuclear Safety/Environmental Impact Evaluation

1. Procedure 1622.2- (No.) RELEASING RAD GAS WASTE (Title) 2-79-068 (Temporary Change Notice No.)

2. Nuclear Safety Evaluation

Does the attached procedure change:

*(a) increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety? . . . . . yes ☐ no ☑

*(b) create the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report? . . . . . yes ☐ no ☑

*(c) reduce the margin of safety as defined in the basis for any technical specification? . . . . . yes ☐ no ☑

Details of Evaluation (Explain why answers to above questions are "no". Attach additional pages if required.)

This change does not affect Nuclear Safety however allows for a hydrogen purge through HPR 229

Evaluation By L. Lawley Date 3/13/79

3. Environmental Impact Evaluation

M. Wesley Jr FOR G.J. TROFFER 3/14/79

Does the attached procedure change:

(a) possibly involve a significant environmental impact? . . . . . yes ☐ no ☑

(if 3(a) is "yes", answer questions (b) and (c) and fill in "Details of Evaluation" below. If "no", state why by filling in the "Details of Evaluation" below) . . . . . yes ☐ no ☐

*(b) have a significant adverse effect on the environment? . . . . . yes ☐ no ☑

*(c) involve a significant environmental matter or question not previously reviewed and evaluated by the N.R.C. . . . . yes ☐ no ☑

Details of Evaluation (Attach additional pages if required)

No affect on environmental safety by allowing for hydrogen purge.

Evaluation By L. Lawley Date 3/13/79

4. Unit Superintendent requests PORC review ☐ Check if YES.

5. Approval

Evaluation Accompanying PCR

_____ (Unit Superintendent) _____ (Date)

Evaluation Accompanying TCN

Approval A Miller (SRO Licensee) 3-14-79 (Date)

Reviewed L. Wesley (Member of Plant Staff) 3-14-79 (Date)

Approval _____ (Unit Superintendent) _____ (Date)

NOTE: The Evaluation "Accompanying a PCR" evaluation and approval chain may be followed at anytime.

206 035

	25 for N.G. + H-3	from 3	THIS RELEASE	ALLOTMENT	ALLOTMENT % RELEASE
PARTICULATES			µci	2.35×10^4 µCi	
?LE GASSES + H-3		cc	cc	1.9×10^{16} cc	

COMPLETE THIS SECTION IF HOLD-UP TIME >45 DAYS OR IF REACTOR BLDG.

F_1 = (0.15/µ Ci/Sec) (2.12 x 10^3 ft^3/min/cc/Sec) = _____ ft^3/min

_____ µ Ci/cc TOTAL from 24

F_G = (6.0x10^4 M^3/Sec) (2.12 x 10^{+3} ft^3/min/M^3/Sec) = _____ ft^3/min

_____ TOTAL FROM 25

LOWEST = FM

☐ COMPLETE THIS SECTION IF HOLD-UP TIME <45 DAYS

F_1 = (1.5x10^{-3} Ci/Sec) (2.12 x 10^3 ft^3/min/cc/Sec) = _____ ft^3/min

_____ µ Ci/cc TOTAL COL 24

F_G = (1.2x10^3 M^3/Sec) (2.12 x 10^{+3} ft^3/min/M^3/Sec) = _____ ft^3/min

_____ TOTAL COL 25

LOWEST = FM

FILL IN THIS SIDE FOR WASTE DECAY TANKS

31 ☐ IF FM < 1.1 $\frac{ft^3}{min}$ DO NOT RELEASE TANK RETURN TO SHIFT SUPERVISOR

☐ COMPLETE THIS SECTION IF 1.1 < FM < 10 $\frac{ft^3}{min}$

VDG-FR-1484-1 ALARM SETPOINT=FM= _____ $\frac{ft^3}{min}$

VDG-V60 SETPOINT = 0.9x FM = _____ ft^3/min

☐ FM > 10 ft^3/MIN

VDG-FR-1484-1 ALARM SETPOINT= _____ $\frac{ft^3}{min}$

VDG-V60 SETPOINT = [a] ft^3/min

FILL IN THIS SIDE FOR REACTOR BLDG.

32 ☐ IF FM < 27777 Ft^3/Min DO NOT RELEASE TANK * RETURN TO SHIFT/SUPERVISOR

COMPLETE THIS PART IF 27777<FM<55555 ft^3/min

RELEASE RATE = FM = [25000] ft^3/min

COMPLETE THIS PART IF FM>55555 ft^3/min

RELEASE RATE = FM = [55000] ft^3/min

* EXCEPT FOR HYDROGEN PURGE

ESTIMATED READINGS OF VDG-R-1480 and HP-R-219

33 VDG-R-1480 (Gas Channel)

[µ Ci/cc Xe-133] [CAL FACT Xe-133] • [BKG] = _____ cpm VDG-R-1480 G

34 HP-R-219 (Gas Channel)

[µ Ci/cc Xe-133] [CAL FACT Xe-133] [FM] • [BKG] = _____ cpm HP-R-219G

HP-R-219 FLOW CFM

35 HP-R-219 (Iodine Channel)

[µ Ci/cc I-131] [CAL FACT I-131] [filt. fact] [V] • [BKG]

HP-R-219 Flow CFM

= _____ cpm HP-R-219I

36 HP-R-219 (Particulate Channel)

[µ Ci/cc Cs-137] [CAL FACT] [filt. fact] [V] • [BKG]

HP-R-219 FLOW CFM

= _____ cpm HP-R-219P

ESTIMATED READINGS OF HP-R-225 and HP-R-226 or HPR-2

34 GAS CHANNEL

[µ Ci/cc Xe-133] [FM / FLOW out STACK] [CAL FACTOR Xe-133] • [BKG]

= _____ cpm HP-R-225G

= _____ cpm HP-R-226G OR = _____ cpm HPR

35 IODINE CHANNEL

[µ Ci/cc I-131] [FILT. FACT.] [V / FLOW out STACK] [CAL FACT. I-131] • [BKG]

= _____ cpm HP-R-225I

= _____ cpm HP-R-226I OR = _____ cpm HPR2

36 PARTICULATE CHANNEL

[µ Ci/cc Cs-137] [FILT. FACT.] [V / FLOW out STACK] [CAL FACTOR Cs 137] • [BK

= _____ cpm HP-R-225P

= _____ cpm HP-R-226P OR = _____ cpm HPR2

CAL FACTORS ARE AVAILABLE IN CONTROL ROOM

206 036

5.29 Enter the result of 100 x estimated quantity in this release from (28) divided by the quarterly release allotment.

5.30 Complete the upper section if this is a waste gas tank that has been isolated for greater than 45 days, or if this is a Reactor Building release. Two flows are calculated. Transfer the lowest value to the box to the right (lowest F_m). This is the maximum flow rate (F_m) that can be allowed in order not to exceed the instantaneous release limits. Complete the lower section in an identical manner only if this is a waste decay tank that has been isolated for < 45 days.

NOTE: If flow rate in block (30) is too restrictive for release go to block (30A). Complete Block (30A) as per step 5.30 above with the concurrence of the Shift Supervisor that Unit I will not release gaseous waste during this period.

5.31 Fill in the left side of the form for waste decay tank releases. If F_m is < (1.1) CFM, then this tank is too radioactive to be released under normal conditions; return from at this point to the Shift Supervisor. If F_m is greater than 1.1 CFM but less than 10 CFM, then the WDG-FR-1484-1 set point is the value of F_m. The actual release rate, WDG-V-188 A/B set point will be adjusted to 90% of F_m. F_m is obtained from (30). If F_m is > (10) CFM, check the box. The maximum value the alarm can be set is (10) CFM, therefore, this value will be used. WDG-V-188 A/B will be adjusted to (9) CFM.

5.32 Fill in the right side of the form for reactor building releases. If F_m as calculated in (30) or (30A) is < 27777 CFM the reactor, do not release and return form to Shift Supervisor except for Hydrogen Purge. ~~building air is too radioactive to be released under normal conditions; return form to the Shift Supervisor.~~ The Hydrogen Purge rate is 150 cfm. If F_m is > 27777 CFM but less than 55555 CFM, then AH-FR-5063 or AH-FR-5064 reading is the value F_m from (30). The reactor building purge rate is 25000 CFM.

206 037

If the F_M calculated in (30) is > 55555 CFM check the last box. The maximum release rate is 50,000 CFM.

5.33 For gases, it is estimated that the dominant long lived activity will be Xe-133; therefore, this nuclide is used for estimated reading. For WDG-R-1480 multiply the specific activity of Xe-133 in µCi/cc from (19) by the calibration factor of WDG-R-1480 in cpm/µcicc. Add to this the background of WDG-R-1480. The calibration factor and background for this monitor and for all other monitors is obtainable from the Control Room remote readout or from the local meter on the monitor.

5.34.1 For HP-R-219 gas channel, the Xe-133 specific activity in µCi/cc is obtained from (19). F_m is obtained from (30) The building purge flow is obtained from the HP-R-219 flow meter on the HP-R-219 monitor.

5.34.2 For Reactor Building purge gas channel, the Xe-133 specific activity in µCi/cc is obtained from (19) F_m is obtained from (30) The flow out of the stack is obtained from AH-FR-5063 for HP-R-225 and AH-FR-5064 for HP-R-226, or AH-FR-5080 for HPR229. F_m for Hydrogen Purge is 150 cfm.

5.35.1 For HP-R-219 iodine channel, I-131 is estimated to be the dominant activity, therefore, the specific activity of I-131 is obtained from (19) on the charcoal filter, the filter factor is obtained from (20), and V is the estimated volume to be released in Ft^3 from (3.)

5.35.2 For Reactor Building purge Iodine Channel, I-131 specific activity is obtained from (19) the filter factor is obtained from (20), V is the volume estimated to be released in Ft^3 from (3.) The flow out the stack is from AH-FR-5063 for HP-R-225 and AH-FR-5064 for HP-R-226, or AH-FR-5080 for HPR229.

206 038

5.36.1 For HP-R-219 particulate channel, Cs-137 specific activity from (19) is used, V is the estimated volume to be released in Ft^3 from (3.)

5.36.2 For Reactor Building purge particulate channel, Cs-137 is estimated to be the dominant activity. Therefore, the specific activity of Cs-137 in μCi/cc is obtained from (19,) the filter factor for particulate is obtained from (20.) The flow out the reactor building stack is obtained from AH-FR-5063 for HP-R-225 and AH-FR-5064 for HP-R-226, or AH-FR-5080 for HPR229. V is the volume in ft^3 of the Reactor Building from (3.)

5.37 The quarterly allotment used to date in this quarter for both I plus particulates and Noble gases is obtained from the RECORD OF GASEOUS RELEASES LOG (see 1675). The estimated quarterly allotments of I-131 and Noble gases for this release are obtained from (29.) If either of the sums are greater than 100%. then this release cannot be made without notifying the NRC. Radiation Protection responsibilities include filling in the information contained in the boxes in parts (39) and (42.)

(39) from (31) or (32)

(42) from (33,) (34,) (35,) (36)

5.38 The Radiation Protection Supervisor/Chemist will evaluate the data, check the calculations and recommend the release be approved or disapproved. Then the Supervisor of Radiation Protection and Chemistry/Unit Superintendent or designated representative will make a similiar review and recommendations. The final authority for approval of a gaseous release rests with the Shift Supervisor. Then, and only then will the tank be released.

206 039

"TEMPORAR[illegible] CHANGE"

1001

Figure 1001 - 5

NOTE: Instructions and guidelines in AP 1001 must be followed when completing this form.

Three Mile Island Nuclear Station
Temporary Change Notice (TCN)

SIDE 1

TCN NO. 2-79-057 (From TCN Log Index)

Unit No. II

Date ~~3-5-79~~ 3-5-79

1. Procedure HPP 1632-2 (No.) Releasing Radioactive Gaseous Waste from Unit II (Title)

2. Change (Include page numbers, paragraph numbers, and exact wording of change.)

see attached page.

3. Reason for Change:

to update permit with existing change in procedure.

4. Recommended by [signature] 2/23/79 (Date) 5. [signature] (Supervisor's Signature) 2/23/79 (Date)

6. Duration of TCN - No longer than ninety days from effective date of TCN or as in (a) or (b) below whichever occurs first.

(a) TCN will be cancelled by a procedure revision issued as a result of a Procedure Change Request to be submitted by [signature] (Supervisor Submitting TCN) (Submit PCR as soon as possible) ☒

(b) TCN is not valid after _____ (Fill in circumstances which will result in TCN being cancelled) ☐

7. (a) Is the procedure on the Nuclear Safety Related Procedure List? (Sec. AP 1001 – Appendix B) If "Yes", complete Nuclear Safety Evaluation. (Side 2 of this Form) Yes ☒ No ☐

(b) Is the procedure on the Environmental Impact Procedure List? (Sec. AP 1001 – Appendix B) If "Yes", complete Environmental Evaluation. (Side 2 of this Form) Yes ☒ No ☐

(c) Does the change effect the intent of the original procedure? Yes ☐ No ☒

NOTE: If all answers are "no" the change may be approved by the Shift Supervisor. If question (c) is answered "yes", the change must be reviewed by the PORC and approval by the Station/Unit Superintendent prior to implementation. If the answer to question (c) is "no" the change may be approved by two members of the plant management staff at least one of whom holds a senior reactor operators license on the unit affected in accordance with paragraph 3.6.4.2 of AP 1001.

8. Review and Approval

Block (c) "yes"

Approved [signature] (Shift Supervisor/Foreman) 3/3/79 (Date)

Reviewed [signature] 3/5/79

Members [signature] 3/5/79

Of PORC [signature] 3/5/79

[signature] 3/5/79

Contacted _____ (PORC Members) _____ (Date)

Approved [signature] (Unit Superintendent) 3/6/79 (Date)

Block (c) "no"

Approved _____ (SRO License) _____ (Date)

_____ (Member Plant Mgt. Staff) _____ (Date)

Reviewed _____ (Chairman of PORC) _____ (Date)

Approved _____ (Unit Superintendent) _____ (Date)

NOTE: The block (c) "Yes" review and approval chain may be followed at anytime.

9. Approval
Manager, Generation Quality Assurance [signature] Date _____

NOTE: M G Q A approval required only on certain Administrative Procedures listed in Enclosure 7 of AP 1001

10. TCN is Cancelled _____ (Shift Supervisor/Shift Foreman) _____ (Date)

206 040

TMI 56 Rev. 8 77

"EVALUATION"

AP-1001 Three Mile Island Nuclear Station SIDE 2

Figure 1001-4 Nuclear Safety/Environmental Impact Evaluation

1. Procedure HPP 1622-2 (No.) Releasing Radioactive Gaseous Waste from Unit II (Title) 2-79-057 (Temporary Change Notice No.)

2. Nuclear Safety Evaluation

Does the attached procedure change:

*(a) increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety? . . . . . yes ☐ no ☑

*(b) create the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report? . . . . . yes ☐ no ☑

*(c) reduce the margin of safety as defined in the basis for any technical specification? . . . . . yes ☐ no ☑

Details of Evaluation (Explain why answers to above questions are "no". Attach additional pages if required.)

This change only update permit with existing changes in procedure. Also to change flow rate used from calculated reading to actual readings.

Evaluation By [signature] Date 2/23/79

3. Environmental Impact Evaluation

Does the attached procedure change: [signature] FOR G.J. TROFFER 3-6-79

(a) possibly involve a significant environmental impact? . . . . . yes ☐ no ☑

(if 3(a) is "yes", answer questions (b) and (c) and fill in "Details of Evaluation" below. If "no", state why by filling in the "Details of Evaluation" below) . . . . . yes ☐ no ☐

* (b) have a significant adverse effect on the environment? . . . . . yes ☐ no ☐

* (c) involve a significant environmental matter or question not previously reviewed and evaluated by the N.R.C. . . . . yes ☐ no ☐

Details of Evaluation (Attach additional pages if required)

This change update permit with existing changes in procedure. Also to change flow rate used from calculated reading to actual readings.

Evaluation By [signature] Date 2/23/79

4. Unit Superintendent requests PORC review ☐ Check if YES.

5. Approval

Evaluation Accompanying PCR

[signature] (Unit Superintendent) 3/6/79 (Date)

Evaluation Accompanying TCN

Approval [signature] (SRO License) (Date)

Reviewed [signature] (Member of Plant Staff) (Date)

Approval [signature] (Unit Superintendent) (Date)

NOTE The Evaluation "Accompanying a PCR" evaluation and approval chain may be followed at anytime.

206 041

5.29 Enter the result of 100 x estimated quantity in this release from (28) divided by the quarterly release allotment.

5.30 Complete the upper section if this is a waste gas tank that has been isolated for greater than 45 days, or if this is a Reactor Building release. Two flows are calculated. Transfer the lowest value to the box to the right (lowest F_m). This is the maximum flow rate (F_m) that can be allowed in order not to exceed the instantaneous release limits. Complete the lower section in an identical manner only if this is a waste decay tank that has been isolated for < 45 days.

NOTE: If flow rate in block (30) is too restrictive for release go to block (30A). Complete Block (30A) as per step 5.30 above with the concurrence of the Shift Supervisor that Unit I will not release gaseous waste during this period.

5.31 Fill in the left side of the form for waste decay tank releases. If F_m is < (1.1) CFM, then this tank is too radioactive to be released under normal conditions; return from at this point to the Shift Supervisor. If F_m is greater than 1.1 CFM but less than 10 CFM, then the WDG-FR-1484-1 set point is the value of F_m. The actual release rate, WDG-V-188 A/B set point will be adjusted to 90% of F_m. F_m is obtained from (30). If F_m is > (10) CFM, check the box. The maximum value the alarm can be set is (10) CFM, therefore, this value will be used. WDG-V-188 A/B will be adjusted to (9) CFM.

5.32 Fill in the right side of the form for reactor building releases. If F_m as calculated in (30) or (30A) is < 27777 CFM the reactor building air is too radioactive to be released under normal conditions; return form to the Shift Supervisor. If F_m is > 27777 CFM but less than 55555 CFM, then AH-FR-5063 or AH-FR-5064 reading is the value F_m from (32). The reactor building purge rate is 25000 CFM.

If the F_M calculated in (30) is > 55555 CFM check the last box. The maximum release rate is 50,000 CFM.

5.33 For gases, it is estimated that the dominant long lived activity will be Xe-133; therefore, this nuclide is used for estimated reading. For WDG-R-1480 multiply the specific activity of Xe-133 in µCi/cc from (19) by the calibration factor of WDG-R-1480 in cpm/µcicc. Add to this the background of WDG-R-1480. The calibration factor and background for this monitor and for all other monitors is obtainable from the Control Room remote readout or from the local meter on the monitor.

5.34.1 For HP-R-219 gas channel, the Xe-133 specific activity in µCi/cc is obtained from (19). F_m is obtained from (30). The building purge flow is obtained from the HP-R-219 flow meter on the HP-R-219 monitor.

5.34.2 For Reactor Building purge gas channel, the Xe-133 specific activity in µCi/cc is obtained from (19). F_m is obtained from (20). The flow out of the stack is obtained from AH-FR-5063 for HP-R-225 and AH-FR-5064 for HP-R-226.

5.35.1 For HP-R-219 iodine channel, I-131 is estimated to be the dominant activity, therefore, the specific activity of I-131 is obtained from (19) on the charcoal filter, the filter factor is obtained from (20), and V is the estimated volume to be released in Ft^3 from (3.)

5.35.2 For Reactor Building purge Iodine Channel, I-131 specific activity is obtained from (19) the filter factor is obtained from (20), V is the volume estimated to be released in Ft^3 from (3.) The flow out the stack is from AH-FR-5063 for HP-R-225 and AH-FR-5064 for HP-R-226.

206 043

PARTICULATES		cc	µc.i	2.35x10⁴ uCi
OBLE GASSES + H-3		cc	cc	1.9 x 10¹⁰ cc

☐ COMPLETE THIS SECTION IF HOLD-UP TIME >45 DAYS OR IF REACTOR BLDG.

30 F_I= (0.15/ µ Ci/cc TOTAL from 24) (2.12 x 10³ ft³/min/cc/Sec) = ____ ft³/min

F_G = (6.0x10⁴ M³/Sec) (2.12 x 10⁻³ ft³/min/M³/Sec) / TOTAL FROM 25 = ____ ft³/min

} LOWEST = FM ____

☐ COMPLETE THIS SECTION IF HOLD-UP TIME <45 DAYS

F_I = (1.5x10⁻³ Ci/Sec) (2.12 x 10³ ft³/min/cc/Sec) / µ Ci/cc TOTAL COL 24 = ____ ft³/min

F_G = (1.2x10³ M³/Sec) (2.12 x 10⁻³ ft³/min/M³/Sec) / TOTAL COL 25 = ____ ft³/min

} LOWEST = FM ____

FILL IN THIS SIDE FOR WASTE DECAY TANKS	FILL IN THIS SIDE FOR REACTOR BLDG.
31 ☐ IF FM < 1.1 ft³/min DO NOT RELEASE TANK RETURN TO SHIFT SUPERVISOR ☐ COMPLETE THIS SECTION IF 1.1 < FM < 10 ft³/min VDG-FR-1484-1 ALARM SETPOINT=FM= ____ ft³/min WDG-FR-1484-1 SETPOINT =0.9x FM = ____ ft³/min ☐ FM >10 ft³/MIN VDG-FR-1484-1 ALARM SETPOINT= 10 ft³/min WDG-FR-1484-1 SETPOINT = 9 ft³/min	32 ☐ IF FM < 27777 Ft³/Min DO NOT RELEASE TANK RETURN TO SHIFT/SUPERVISO COMPLETE THIS PART IF 27777<FM<55555 ft³/m RELEASE RATE = FM = 25000 ft³/min COMPLETE THIS PART IF FM>55555 ft³/min RELEASE RATE = FM= 50000 ft³/min
ESTIMATED READINGS OF VDG-R-1480 and HP-R-219	ESTIMATED READINGS OF HP-R-225 and HP-R-226
33 VDG-R-1480 (Gas Channel) [µ Ci/cc Xe-133] [CAL FACT Xe-133] • [BKG] = ____ cpm VDG-R-1480 G	34 GAS CHANNEL [µ Ci/cc Xe-133] [FM / FLOW out STACK] [CAL FACTOR Xe-133] • [BKG] = ____ cpm HP-R-225G = ____ cpm HP-R-226G
34 HP-R-219 (Gas Channel) [µ Ci/cc Xe-133] [CAL FACT Xe-133] [FM] • [BKG] = ____ cpm HP-R-219G HP-R-219 FLOW CFM	35 IODINE CHANNEL [µ Ci/cc I-131] [FILT. FACT] [V / FLOW out STACK] [CAL FACT. I-131] • [BKG] = ____ cpm HP-R-225I = ____ cpm HP-R-226I
35 HP-R-219 (Iodine Channel) [µ Ci/cc I-131] [CAL FACT I-131] [Filt. Fact] [V] • [BKG] HP-R-219 Flow CFM = ____ cpm HP-R-219I	36 PARTICULATE CHANNEL [µ Ci/cc Cs-137] [FILT. FACT] [V / FLOW out STACK] [CAL FACTOR Cs-137] • [BKG] = ____ cpm HP-R-225P = ____ cpm HP-R-226P
36 HP-R-219 (Particulate Channel) [µ Ci/cc Cs-137] [Filt. Fact] [V] • [BKG] HP-R-219 FLOW CFM = ____ cpm HP-R-219P	

CAL FACTORS ARE AVAILABLE IN CONTROL ROOM

206 044

GASEOUS RELEASE PERMIT

02/05/79 Unit - 2

RELEASE NUMBER (3)

(1) TIME: REQUESTOR: SHIFT SUPERVISOR:

(2)
- ☐ WDG-T-1A DECAY TANK A
- ☐ WDG-T-1B DECAY TANK B
- ☐ REACTOR BUILDING

(3)
- ☐ TANK ISOLATED AND "DO NOT OPERATE" tagged: DATE: TIME:
- HOLD UP TIME: DAYS.
- P=TANK OR REACTOR BLDG. PRESSURE= psig

ESTIMATED VOLUME TO BE RELEASED = "

REACTOR BLDG. : $2.00 \times 10^6 \times \left[\frac{P+14.7}{14.7}\right] =$ ft³ x 2.83 x 10^4 = cc

DECAY TANK : $\frac{1937(P+14.7)}{14.7} =$ ft³ x 2.83 x 10^4 = cc

SIGNATURE

(37)
- % OF QUARTERLY ALLOTMENT USED TO DATE I-131: NOBLE GASSES
- % OF QUARTERLY ALLOTMENT THIS DUMP I-131: NOBLE GASSES
- ☐ LAST RELEASE ☐ INCLUDED. TOTAL I-131: NOBLE GASSES

(38)
- ☐ RELEASE RECOMMENDED BY RADIATION PROT. SUPER/FOREMAN
- ☐ RELEASE RECOMMENDED BY SUPER. RAD. PROT. & CHEM/UNIT SUPT
- ☐ RELEASE APPROVED BY SHIFT SUPERVISOR

RELEASE DATA (39.1) Rad. Prot. Dept. Notified to grab 18 hr. sample of HP-R-219 for H₂ & Gas (42.1) Rad. Prot. Dept. has sample dried and gas to count HP-R-219 for H₂

(41) WDG-FR-1401-1 ALARM SET POINT AT / WDG-T-1A/B LOADED TO — μCi/cc Init. O R

(43) Reactor Bldg purge rate — ft³/min
AH-FR-5063 Reading — ft³/min Init.
AH-FR-5064 Reading

(45) RELEASE STARTED — TIME — DATE
RELEASE STARTED — TIME — DATE
TOTAL TIME OF RELEASE — MIN

(47) Decay Tank or R.B PRESSURE AT START — psi
Decay Tank or R.B. PRESSURE AT STOP — psi
ΔP= — psi

(49) HP-R-219 Filter Change
BEGINNING
END

FLOW RECORDER MARKED ☐ BEGINNING ☐ END
RAD MONITOR RECORDER MARKED ☐ BEGINNING ☐ END
METEOROLOGY RECORDER MARKED ☐ BEGINNING ☐ END
Source Check Sat. ☐ Beginning INITIALS

INSTRUMENT READINGS:

(52)

		MAXIMUM ESTIMATED READING cpm	READING PRIOR TO RELEASE	READING AFTER ½ RELEASE	READING AFTER ¾ RELEASE	READING AFTER ¾ RELEASE	READING AFTER RELEASE COMPLETED	HIGHEST READING DURING RELEASE
REACTOR BUILDING	HP-R-225P							
	HP-R-225I							
	HP-R-226G							
	HP-R-226P							
	HP-R-226I							
	HP-R-226G							
Decay Tanks	WDG-R-1400G							
	HP-R-219P							
	HP-R-219I							
	HP-R-219G							

(54) RELEASE DATA COMPLETED INITIALS ALL DATA REQUIRED ON THIS FORM HAS BEEN COMPLETED.

206 045

16-9

CONTROL ROOM
FILE COPY

1622.2
Revision 5
03/26/79

[redacted]

THREE MILE ISLAND NUCLEAR STATION

STATION HEALTH PHYSICS PROCEDURE 1622.2

RELEASING RADIOACTIVE GASEOUS WASTE FROM UNIT-2

Table of Effective Pages

[redacted]

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1.0	10/05/77	0	26.0			51.0		
2.0	06/08/78	1	27.0			52.0		
3.0	06/08/78	1	28.0			53.0		
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5.0	10/05/77	0	30.0			55.0		
6.0	10/05/77	0	31.0			56.0		
7.0	10/05/77	0	32.0			57.0		
8.0	06/08/78	1	33.0			58.0		
9.0	03/26/79	5	34.0			59.0		
10.0	03/26/79	5	35.0			60.0		
11.0	08/08/78	2	36.0			61.0		
12.0	10/06/78	3	37.0			62.0		
13.0	02/05/79	4	38.0			63.0		
14.0	06/08/78	1	39.0			64.0		
15.0	10/05/77	0	40.0			65.0		
16.0	03/26/79	5	41.0			66.0		
17.0	10/05/77	0	42.0			67.0		
18.0	03/26/79	5	43.0			68.0		
19.0	02/05/79	4	44.0			69.0		
20.0	02/05/79	4	45.0			70.0		
21.0			46.0			71.0		
22.0			47.0			72.0		
23.0			48.0			73.0		
24.0			49.0			74.0		
25.0			50.0			75.0		

CONTROLLED COPY

Unit 1 Staff Recommends Approval

Approval N/A Date —

Cognizant Dept. Head

Unit 2 Staff Recommends Approval

Approval N.A Date —

Cognizant Dept. Head

Unit 1 PORC Recommends Approval

— N/A Date —

Chairman of PORC

Unit 2 PORC Recommends Approval

R P Warren Date 3/23/79

V-Chairman of PORC

Unit 1 Superintendent Approval

N/A Date —

Unit 2 Superintendent Approval

[signature] Date 3/26/79

Manager Generation Quality Assurance Approval N.A Date —

TMI 55-A Rev 8/77

206 046

THREE MILE ISLAND NUCLEAR STATION

STATION HEALTH PHYSICS PROCEDURE 1622.2

RELEASING RADIOACTIVE GASEOUS WASTE FROM UNIT-2

1.0 PURPOSE

This procedure describes the regulations applicable to radioactive gaseous discharges to unrestricted areas and the monitoring programs designed to ensure compliance with these regulations.

2.0 DISCUSSION

2.1 Radioactive gases result primarily from the escape of gaseous fission products from the fuel, and by neutron activation of constituents in the water and air in the immediate vicinity of the core. Those radioactive gases that are produced in or released to the reactor coolant should ultimately be collected in the low pressure vent header system and compressed in the waste gas decay tanks for decay and re-use or release to the atmosphere. Normal hold-up time in the waste gas decay tanks will be at least 45 days. Shorter hold-up times can be employed provided the appropriate environmental tech. specs. are satisfied.

2.2 The other source of gaseous waste comes from purging the atmosphere of the reactor building. Radioactive gases in the reactor building come from neutron activation of the atmosphere or from gaseous leaks from the reactor coolant system.

2.3 Radioactive gases are released through the unit vent from the Reactor Building exhaust system, main condenser vacuum pump exhaust, fuel handling exhaust, auxiliary Building exhaust and Waste Gas Decay System. The gases are continuously monitored and recorded. This is a continuous release and is sampled periodically as per requirements in the Tech. Specs.

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2.4 Analysis of gaseous effluent is necessary to ensure adherence to the "as low as reasonably achievable" philosophy and to assure compliance with Environmental Technical Specifications. Environmental Technical Specifications limit the release rates for noble gases, H_3, radioactive iodine and particulates.

2.4.1 The Technical Specifications contain two types of limits (instantaneous release rates, and quarterly average release rates) for two classes of radioactive materials (Iodine-131 and particulates with half-lives greater than 8 days, and gross gaseous activity. Under unusual conditions, the quarterly average limit used in this report may be increased, but this requires notification of the NRC.

2.4.2 The values used for instantaneous releases are as follows:

Gross Gaseous: $\sum \frac{Qi}{MPCi} \leq 1.2 \times 10^5$ M^3/sec

Where Qi = uCi/sec release rate

MPCi = 10CFR20, Appendix B, Table II, Col. 1

Iodine-131 and Particulates with half lives greater than 8 days: $\leq$ 0.3 uci/sec.

The release flow rates are adjusted to insure that these limits are not exceeded. The above limits are applicable if the gas decay tanks are held for greater than 45 days and for Reactor Building Purge. If the waste gas decay tank is to be held for less than 45 days the following limits apply:

Gross Gaseous: $\sum \frac{Qi}{MPCi} = \leq 2.4 \times 10^3 \ M^3/sec$

Iodine-131 and Particulates with half lives greater than 8 days: $\leq$ 0.003 uci/sec.

2.4.3 The working quarterly average limits are as follows:

Gross Gaseous $\sum \frac{Qi}{MPCi} = \leq 4.8 \times 10^3 \ M^3/sec$

Iodine-131 and Particulates with half lives greater than 8 days: $\leq$ 0.006 uci/sec.

If these limits are exceeded, then the commission must be notified within 30 days.

2.4.4 Under unusual conditions, the following maximum quarterly average limits shall not be exceeded.

Gross Gaseous: $\sum \frac{Qi}{MPCi} = \leq 1.9 \times 10^4 \ M^3/sec$

Iodine-131 and Particulates with half lives greater than 8 days: $\leq$ 0.024 uci/sec.

2.5 The release of radioactive gaseous effluents is continuously monitored by VAR-748 (Condenser Vacuum Pump Discharge), WDG-R-1480 (Waste Gas Decay Tanks), HP-R-219 (Waste Gas Relief Header Unit Vent) and HP-R-225/HP-R-226 (Reactor Building Purge Exhaust). Monitors HP-R-219, HP-R-225 and HP-R-226 detect radioactive noble gases, iodine and particulates. VAR-748 and WDG-R-1480 detect only gaseous radionuclides.

2.5.1 In the event one of the above monitors becomes inoperable, grab samples will be taken as required in the Technical Specifications.

2.5.2 Analysis performed will be as designated in the Environmental Technical Specifications.

3.0 REFERENCES

3.1 FSAR, Unit 2.

3.2 Environmental Technical Specifications.

3.3 1606, Air Sampling for Radioactive Iodine.

3.4 1608, Air Sampling for Tritium.

3.5 1951, Determination of Tritium, and 1958, Gamma Spectrometers.

3.6 2104-1.11, Nuclear Plant Sampling.

3.7 10 CFR 50.

3.8 10 CFR 20

3.9 1631.2, Sampling of Waste Gas Decay Tanks and Reactor Building

3.10 1675, Radioactive Waste Release Records.

4.0 EQUIPMENT

4.1 Charcoal Cartridges.

4.2 2" particulate filters or equivalent

4.3 Geli Detection System

4.4 Sampling container

4.5 Liquid Scintillation Detection System

5.0 OPERATING INSTRUCTIONS

Prior to releasing gaseous effluents to the environment from the Waste Gas Decay Tanks or the Reactor Building, a Gaseous Release Permit must be obtained.

NOTE: In these operating instructions, the item number of section 5 will refer to the identically numbered sections of the Permit.

5.1 Ths Shift Superviosr initiates the request for release, and is responsible to provide items (1) through (3.)

5.2 The appropriate box is checked to indicate whether the Reactor Building or a specific decay tank is to be sampled, analyzed and released.

5.3 In order that no additional gas is added to the waste gas decay tanks before the release is complete, the tank is isolated and conspicuously labeled with a DO NOT OPERATE tag. The date and time of tagging is recorded. The pressure in psig is recorded. This is obtained from the Waste Gas Control panel for the Waste Gas Decay Tanks; and from the Control Room for the Reactor Building Pressure. The Estimated Volume to be released is calculated as indicated and converted to cc. The form is then turned over to the Radiation Protection Department for completion of items (4) through (37.)

5.4 The next sequential Unit release number is assigned and recorded in the RECORD OF GASEOUS RELEASES LOG (see 1675).

5.5 The appropriate box is checked.

5.6 The Radiation/Chemistry Technician/Jr. will then sample the designated tank or reactor building in accordance with 1631.2, Health Physics Procedure for Sampling of Waste Gas Decay Tanks and Reactor Building. The sample collector will record the date and time of sampling; and tag with the appropriate radiation label.

5.7 The Radiation/Chemistry Technician/Jr. responsible for performing analysis, and the Radiation Protection Supervisor/Foreman responsible for approving the data in sections (4) through (25), both sign in the appropriate location after completion of the analysis.

5.8 The date and time of each analysis is recorded.

5.9 The estimated volume to be released in cc is obtained from (3).

5.10 The Station Chemistry Procedure Number followed in performing the required analyses is recorded. The Tech. Spec. limits are divided into limits for two classes of radioactive materials: Iodine-131 and Particulates with half-lives of greater than 8 days, and noble gas and H_3 activity exclusive of Iodine-131 and Particulates with half-lives greater than 8 days. Therefore, the two classes of material are calculated separately. The sampling consists of drawing a known volume of air through a sampling train consisting of a Particulate Filter, and Iodine Filter (charcoal), and then taking a gas sample of the effluent of the sample train. The three samples are analyzed separately, therfore, there are three sections of columns on the form.

The nuclides listed are those expected to be found, or those required to be tabulated in the 1675. All peaks must be quantified. If additioanl nuclides are found, add them to the form.

NOTE: If the Gamma Analysis is not performed in accordance with 1958.3, Perform Steps 10 through 17.

5.11 The volume sample counted is recorded.

5.12 The sample counting time is recorded.

5.13 The gross number of counts, including background, are recorded.

5.14 The background counting time is recorded.

5.15 The total background counts are recorded.

5.16 The net sample count-rate is calculated.

$$\frac{[\text{GROSS COUNTS } (13)]}{[\text{SAMPLE COUNT TIME } (12)]} - \frac{[\text{BACKGROUND COUNTS } (15)]}{[\text{BACKGROUND COUNT TIME } (14)]}$$

5.17 The % counting error (2 δ) is calculated.

$$\frac{2 \times 100 \times \sqrt{\frac{[\text{GROSS COUNTS } (13)]}{[\text{SAMPLE COUNT TIME } (12)]^2} + \frac{[\text{BACKGROUND COUNTS } (15)]}{[\text{BACKGROUND COUNT TIME } (14)]^2}}}{\text{NET SAMPLE COUNT RATE } (16)}$$

5.18 The gamma abundance for the energy listed is tabulated for the nuclides expected to be of importance. All significant peaks must be identified. If other nuclides are found, or if gamma's other than those tabulated are used for the isotopic quantification, the appropriate gamma abundance shall be obtained from TABLE OF THE ISOTOPES.

5.19 Record the Specific Activity (SA). Refer to the appropriate S.C.P for further information. The efficiency of the counter is obtained from charts in the counting room.

$$S.A. = \frac{\text{NET SAMPLE COUNT RATE } (16)}{[\text{SAMPLE VOLUME USED } (11)][\text{GAMMA ABUNDANCE } (18)][2.22 \times 10^6][\text{EFFICIENCY OF COUNTER}]}$$

5.20 The sample is taken before the HEPA filters and charcoal filters which are in the release path of the gaseous release. Therefore, to calculate the concentration released to environment, the concentration

in the sample is multiplied by the FILTER FACTOR. This term is the fraction passing the filter, and is calculated by (1 minus the Filter Retention Efficiency). The methods of measurement are not exacting, and the efficiency will vary with the time, chemical composition, and particulate size. A conservative factor of 0.1 (90% filter retention) is used for particulates and iodine, and 1.0 for gases.

5.21 The MPC's for gases identified are tabulated. If other nuclides are identified, enter the appropriate value from 10 CFR 20, Appendix B, Table 11, Column 1.

5.22 Enter the result of Specific Activity from (19) multiplied by Filter Fraction from (20) divided by MPC from (21), for Noble gases and H_3 in (22).

5.23 Enter the product of Specific Activity from (19) and Filter Fraction from (20), for Iodines and Particulates found in (23).

5.24 Enter the sum of all nuclides in the particulate and charcoal filters in (24).

5.25 Enter the sum of all nuclides in the gas sample in (25).

5.26 Transfer the value from (24) to the top line and the value from (25) to the bottom line.

5.27 Transfer the estimated volume to be released from (3).

5.28 Enter the estimated quantity to be released (product of each line of (26) and (27)) in the corresponding line. The next unnumbered column, (the quarterly release allotment) is the product of the applicable quarterly average limit (see 2.4.3) and the number of seconds in a quarter of a year. This is the Quarterly Release Allotment. The units for gaseous releases have been converted from M^3 to cc.

5.29 Enter the result of 100 x estimated quantity in this release from (28) divided by the quarterly release allotment.

5.30 Complete the upper section if this is a waste gas tank that has been isolated for greater than 45 days, or if this is a Reactor Building release. Two flows are calculated. Transfer the lowest value to the box to the right (lowest F_m). This is the maximum flow rate (F_m) that can be allowed in order not to exceed the instantaneous release limits. Complete the lower section in an identical manner only if this is a waste decay tank that has been isolated for < 45 days.

NOTE: If flow rate in block (30) is too restrictive for release go to block 30A. Complete Block 30A as per step 5.30 above with the concurrence of the Shift Supervisor that Unit I will not release gaseous waste during this period.

5.31 Fill in the left side of the form for waste decay tank releases. If F_m is < (1.1) CFM, then this tank is too radioactive to be released under normal conditions; return from at this point to the Shift Supervisor. If F_m is greater than 1.1 CFM but less than 10 CFM, then the WDG-FR-1484-1 set point is the value of F_m. The actual release rate, WDG-V-188 A/B set point will be adjusted to 90% of F_m. F_m is obtained from (30). If F_m is > (10) CFM, check the box. The maximum value the alarm can be set is (10) CFM, therefore, this value will be used. WDG-V-188 A/B will be adjusted to (9) CFM.

5.32 Fill in the right side of the form for reactor building releases. If F_m as calculated in (30) or (30A) is < 27777 CFM the reactor building air is too radioactive to be released under normal conditions; return form to the Shift Supervisor. If F_m is > 27777 CFM but less than 55555 CFM, then AH-FR-5063 or AH-FR-5064 reading is the value F_m from (32). The reactor building purge rate is 25000 CFM.

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If the F_M calculated in (30) is > 55555 CFM check the last box. The maximum release rate is 50,000 CFM.

5.33 For gases, it is estimated that the dominant long lived activity will be Xe-133; therefore, this nuclide is used for estimated reading. For WDG-R-1480 multiply the specific activity of Xe-133 in uCi/cc from (19) by the calibration factor of WDG-R-1480 in cpm/ucicc. Add to this the background of WDG-R-1480. The calibration factor and background for this monitor and for all other monitors is obtainable from the Control Room remote readout or from the local meter on the monitor.

5.34.1 For HP-R-219 gas channel, the Xe-133 specific activity in uCi/cc is obtained from (19). F_m is obtained from (30). The building purge flow is obtained from the HP-R-219 flow meter on the HP-R-219 monitor.

5.34.2 For Reactor Building purge gas channel, the Xe-133 specific activity in uCi/cc is obtained from (19). F_m is obtained from (32). The flow out of the stack is obtained from AH-FR-5063 for HP-R-225 and AH-FR-5064 for HP-R-226.

TCN #2-79-68 & 2-79-57

5.35.1 For HP-R-219 iodine channel, I-131 is estimated to be the dominant activity, therefore, the specific activity of I-131 is obtained from (19) on the charcoal filter, the filter factor is obtained from (20), and V is the estimated volume to be released in Ft^3 from (3).

5.35.2 For Reactor Building purge Iodine Channel, I-131 specific activity is obtained from (19), the filter factor is obtained from (20), V is the volume estimated to be released in Ft^3 from (3). The flow out the stack is from AH-FR-5063 for HP-R-225 and AH-FR-5064 for HP-R-226.

225 TCN #2-79-68

5.36.1 For HP-R-219 particulate channel, Cs-137 specific activity from (19) is used, V is the estimated volume to be released in Ft^3 from (3.)

5.36.2 For Reactor Building purge particulate channel, Cs-137 is estimated to be the dominant activity. Therefore, the specific activity of Cs-137 in μCi/cc is obtained from (19,) the filter factor for particulate is obtained from (20.) The flow out the reactor building stack is obtained from AH-FR-5063 for HP-R-225 and AH-FR-5064 for HP-R-226, V is the volume in ft^3 of the Reactor Building from (3.) per TCNH-2-79-68

5.37 The quarterly allotment used to date in this quarter for both I plus particulates and Noble gases is obtained from the RECORD OF GASEOUS RELEASES LOG (see 1675). The estimated quarterly allotments of I-131 and Noble gases for this release are obtained from (29.) If either of the sums are greater than 100%. then this release cannot be made without notifying the NRC. Radiation Protection responsibilities include filling in the information contained in the boxes in parts (39) and (42.)

(39) from (31) or (32)

(42) from (33,) (34,) (35,) (36)

5.38 The Radiation Protection Supervisor/Chemist will evaluate the data, check the calculations and recommend the release be approved or disapproved. Then the Supervisor of Radiation Protection and Chemistry/Unit Superintendent or designated representative will make a similiar review and recommendations. The final authority for approval of a gaseous release rests with the Shift Supervisor. Then, and only then will the tank be released.

NOTE: Just prior to release of a waste gas decay tank WDG-R-1480 must be proven operable by a test using the installed check source or equivalent.

5.39 Operations is responsible for completion of the remaining portions of sections (39) through (42). The alarms and valves are set as indicated.

NOTE: Prior to release of gas decay tank or Reactor Building, Operations will notify the Radiation Protection Department prior to release, to insure the changing of HPR-219 particulate and charcoal cartridge.

5.40 Time, date and pressure are filled in when the release starts and ends. (40)

5.41 Mark the records as indicated at the beginning and at the end of the release. (41)

5.42 Record the appropriate instrument readings before, during and after the release.

5.42.1 Insure that a gas and tritium sample have been obtained at approximately the 18 hour point of each reactor building purge.

5.43 The Shift Supervisor will verify that all data from (39) through (43) are complete and accurate. After signing the form, it is returned to the Radiation Protection Department for completion.

NOTE: Operations will notify the Radiation Protection Department after termination of release, to insure the changing of HPR-219 particulate and charcoal cartridge.

5.44 The actual release volume is calculated based upon readings taken during the release ΔP is obtained from (40). For reactor building purges, Fm is from (32) and t is from (40) (total time of release).

5.45 The actual quantity released is calculated by multiplying the specific activity from (19) by the actual release volume from (44).

NOTE 1: For reactor building purges, the additional quantities of isotopes released due to primary system leakage must be accounted for. Threrfore, complete steps 5.46 through 5.53 for reactor building purges only.

NOTE 2: For particulate and Iodine actual quantities released, the HP-R-219 filters are removed and counted for activity. See 1675.

5.46 Total in-leakage time is calculated. Record the time the purge stopped from (40) and the time the Reactor Building was sampled from (6). The in-leakage time is the total time in minutes between these two times.

5.47 Total in-leakage volume is calculated by multiplying the purge rate from (32) by the total in-leakage time from (46) by 2.832×10^4.

5.48 List all gasses identified from gas and tritium samples taken from HPR 219 at approximately the 18 hour point of the purge. Prior to sampling, verify with the Control Rool which purge exhaust lines are in use.

5.49 Record the specific activities of those isotopes identified in the gas and tritium samples taken during the purge.

5.50 Record the MPC values of those isotopes identified in the samples taken during the purge.

5.51 Divide the specific activities in (49) by the MPC values in (50).

5.52 Summarize all (51) entries.

5.53 The additional quantity due to in-leakage (in curies) is calculated by multiplying the specific activities in (49) by the total in-leakage volume from (47) by 10^{-6}.

5.54 For those isotopes listed in (48), the quantities releases as listed in (45) are recorded.

5.55 The actual quantities released (including in-leakage) are calculated by adding columns (53) and (54) for each isotope.

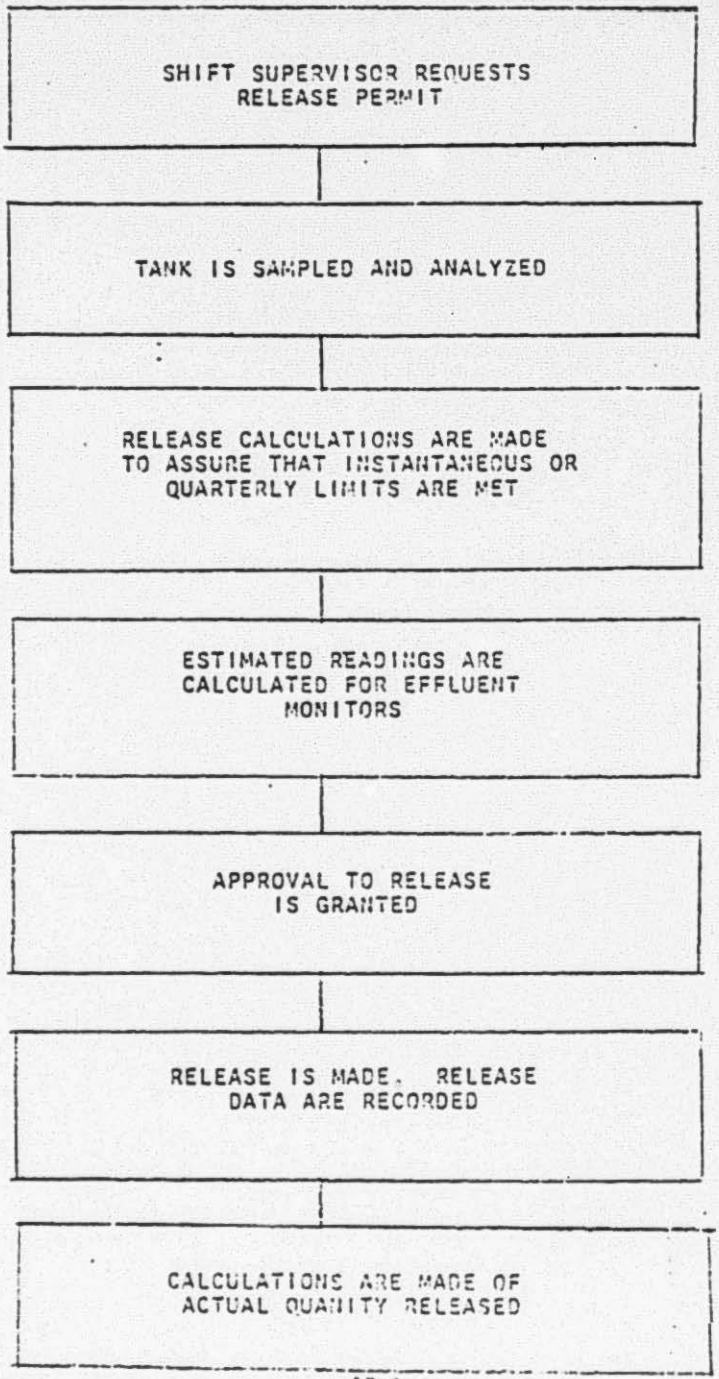
5.56 Enter total from (52).

5.57 Enter volume released from (47).

5.58 Quantity this release is calculated by multiplying (56) by (57).

5.59 Enter the result of 100 times the quantity this release, from (47), divided by the quarterly release allotment, 1.9×10^{16} cc.

5.60 Station Superintendent/Unit Superintendent's approval is required prior to extending purges beyond 48 hours with the reactor coolant system pressurized. Additional samples must be obtained at this time.


SHIFT SUPERVISOR REQUESTS RELEASE PERMIT
TANK IS SAMPLED AND ANALYZED
RELEASE CALCULATIONS ARE MADE TO ASSURE THAT INSTANTANEOUS OR QUARTERLY LIMITS ARE MET
ESTIMATED READINGS ARE CALCULATED FOR EFFLUENT MONITORS
APPROVAL TO RELEASE IS GRANTED
RELEASE IS MADE. RELEASE DATA ARE RECORDED
CALCULATIONS ARE MADE OF ACTUAL QUANTITY RELEASED

1622.2
Revision 8 03/26/79 Unit - 2

GASEOUS RELEASE PERMIT

RELEASE NUMBER (3)

(1) DATE: _____ TIME: _____ REQUESTOR: _____ SHIFT SUPERVISOR

(2)
- ☐ WDG-T-1A DECAY TANK A
- ☐ WDG-T-1B DECAY TANK B
- ☐ REACTOR BUILDING

(3)
- ☐ TANK ISOLATED AND "DO NOT OPERATE" tagged: DATE: _____ TIME _____
- HOLD UP TIME _____ DAYS.
- P=TANK OR REACTOR BLDG. PRESSURE= _____ psig

ESTIMATED VOLUME TO BE RELEASED = V

REACTOR BLDG. : $2.00 \times 10^6 \times \left[\frac{P+14.7}{14.7}\right]$ = _____ $ft^3 \times 2.83 \times 10^4$ = _____ cc

DECAY TANK : $\frac{1937(P+14.7)}{14.7}$ _____ $ft^3 \times 2.83 \times 10^4$ = _____ cc _____ SIGNATURE

(37) % OF QUARTERLY ALLOTMENT USED TO DATE _____ I-131: _____ NOBLE GASSES
% OF QUARTERLY ALLOTMENT THIS DUMP _____ I-131: _____ NOBLE GASSES
_____ LAST RELEASE # INCLUDED. TOTAL _____ I-131: _____ NOBLE GASSES

(38)
- ☐ RELEASE RECOMMENDED BY _____ RADIATION PROT. SUPER/FOREMAN
- ☐ RELEASE RECOMMENDED BY _____ SUPER. RAD. PROT. & CHEM/UNIT SUP'
- ☐ RELEASE APPROVED BY _____ SHIFT SUPERVISOR

RELEASE DATA (39.1) Rad. Prot. Dept. Notified to grab 18 hr. sample of HP-R-219 for H3 & Gas (42.1) Rad. Prot. Dept. has sample HP-R-219 for H3 ☐ and Gas ☐

(41) WDG-FR-1484-1 ALARM SET POINT AT WDGV188 A/B LOADED TO 57 _____ _____ μci/cc Init. | O | R

(39) Reactor Bldg purge rate _____ ft^3/min
AH-FR-9063 Reading _____ ft^3/min
AH-FR-9064 Reading _____ ft^3/min Init.

(40) RELEASE STOPPED _____ TIME _____ DATE
RELEASE STARTED _____ TIME _____ DATE
TOTAL TIME OF RELEASE _____ MIN

(42) Decay Tank or R.B. PRESSURE AT START ____ psi
Decay Tank or R.B. PRESSURE AT STOP ____ psi
ΔP= ____ psi

(41) HR-R-219 Filter Change
BEGINNING _____
END _____

FLOW RECORDER MARKED ☐ BEGINNING ☐ END
RAD MONITOR RECORDER MARKED ☐ BEGINNING ☐ END
METEOROLOGY RECORDER MARKED ☐ BEGINNING ☐ END
Source Check Sat. ☐ Beginning _____ INITIALS

INSTRUMENT READINGS:

(42)

		MAXIMUM ESTIMATED READING cpm	READING PRIOR TO RELEASE	READING AFTER ¼ RELEASE	READING AFTER ½ RELEASE	READING AFTER ¾ RELEASE	READING AFTER RELEASE COMPLETED	HIGHEST READING DURING RELEASE
REACTOR BUILDING	HP-R-225P							
	HP-R-225I							
	HP-R-225G							
	HP-R-226P							
	HP-R-226I							
	HP-R-226G							
Decay Tanks	WDG-R-1480G							
	HP-R-219P							
	HP-R-219I							
	HP-R-219G							

(43) RELEASE DATA COMPLETED _____ INITIALS ALL DATA REQUIRED ON THIS FORM HAS BEEN COMPLETED.

6.0

206 062
SHIFT SUPERVISOR

☐ WDG-T-1A (5)
☐ WDG-T-1B
☐ WDG-T-1C Reactor Building
☐ _____ OTHER

(6) SAMPLE COLLECTED BY _____
DATE _____ TIME _____

(7) RAD. ANAL. Perf. by: _____
APPROVED BY: _____

(8) DATE & TIME OF ANALYSIS
ALPHA _____
BETA _____
GAMMA _____
TRITIUM _____

(9) EST VOLUME TO BE RELEASED _____ cc

(44) ACTUAL VOLUME RELEASED

$$WDG = \frac{1937(\Delta P)(2.83 \times 10^4)}{14.7} = \_\_\_\_ cc$$

$$R.B. = 5.66 \times 10^{10}\left(1 - e^{-\frac{FMt}{2 \times 10^6}}\right)\left(\frac{\Delta P + 14.7}{14.7}\right)$$

		(10) COUNT METHOD (Procedure Number)	(11) VOLUME OF SAMPLE USED (ml)	(12) SAMPLE COUNT TIME (min)	(13) GROSS COUNTS	(14) BKG COUNT TIME (min)	(15) BKG COUNTS	(16) NET SAMPLE COUNT RATE (cpm)	(17) % ERROR 2σ	(18) GAMMA ABUNDANCE @ KEV	(19) SPECIFIC ACTIVITY μCi/ml	(20) FILTER FRACTION	MPC (21) μCi/ml	(S.A.)(FF)/MPC (22)	(S.A.)(FF) (23)	(45) ACTUAL QTY RELEASED (SA)(FF)(ACT. VOL)
PARTICULATE	GROSS α									N.A.						
	GROSS β									N.A.						
	I 131									.82@364		.1				
	Cs 134									.98@605		.1				
	Cs 137									.85@662		.1				
	Ba 140									.34@537		.1				
	La 140									.96@1596		.1				
CHARCOAL FILTER	I 131									.82@364		.1				
	I 133									.90@530		.1				
	I 135									.37@1140		.1				
													(24) TOTAL =			
GASSES *	^{3}H									N.A.		1	2E-7			
	Kr 85									.0016@514		1	3E-7			
*	Kr 87									.35@2570		1	2E-8			
*	Kr 88									.35@2400		1	2E-8			
*	Kr 85m									.74@150		1	1E-7			
*	Xe 133									.37@81		1	3E-7			
	Xe-135									.91@250		1	1E-7			
	Xe-135m									.80@527		1	3E-8			
	Xe 138									.17@1768		1	3E-8			
	A 41									.99@1293		1	4E-8			
													TOTAL: (25)			

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1622.2. Revision 5

03/26/79	26 Total from 24 for 1 part 25 for N.G. + H-3	27 ESTIMATED VOLUME TO BE RELEASED (curies)	28 EST. QTY. THIS RELEASE	U.S. RELEASE ALLOTMENT	29 EST ALLOTMENT - THIS RELEASE
I + PARTICULATES			µci	2.35×10^4 µCi	
OBLE GASSES + H-3			∞	1.9×10^{16} cc	

MPLETE THIS SECTION IF HOLD-UP TIME >45 DAYS OR IF REACTOR BLDG.

= (0.15/ µ Ci/Sec) (2.12 x 10^3 ft^3/min/cc/Sec) = _____ ft^3/min

_____ µ Ci/cc TOTAL from 24

F_G = (6.0x10^4 M^3/Sec) (2.12 x 10^{-3} ft^3/min/M^3/Sec) = _____ ft^3/min

_____ TOTAL FROM 25

LOWEST = FM

MPLETE THIS SECTION IF HOLD-UP TIME <45 DAYS

= (1.5x10^{-3} Ci/Sec) (2.12 x 10^3 ft^3/min/cc/Sec) = _____ ft^3/min

_____ µ Ci/cc TOTAL COL 24

F_G = (1.2x10^3 M^3/Sec) (2.12 x 10^{-3} ft^3/min/M^3/Sec) = _____ ft^3/min

_____ TOTAL COL 25

LOWEST = FM

N THIS SIDE FOR WASTE DECAY TANKS

IF FM < 1.1 $\frac{ft^3}{min}$ DO NOT RELEASE TANK RETURN TO SHIFT SUPERVISOR

COMPLETE THIS SECTION IF 1.1 < FM < 10 $\frac{ft^3}{min}$

R-1484-1 ALARM SETPOINT=FM= _____ ft^3/min

/B SETPOINT =0.9x FM = _____ ft^3/min

FM >10 ft^3/MIN TCN# 79-5

-1484-1 ALARM SETPOINT= 10 ft^3/min

188 A/B SETPOINT = _____ ft^3/min

FILL IN THIS SIDE FOR REACTOR BLDG.

32 ☐ IF FM < 27777 Ft^3/Min DO NOT RELEASE TANK RETURN TO SHIFT SUPERVISOR

COMPLETE THIS PART IF 27777<FM<55555 ft^3/min

RELEASE RATE = FM = 25000 ft^3/min

COMPLETE THIS PART IF FM>55555 ft^3/min

RELEASE RATE = FM= 50000 ft^3/min

see TCN# 2-79-65

TED READINGS OF VDG-R-1480 and HP-R-219

G-R-1480 (Gas Channel)

[X-133] [CAL FACT X-133] • [BKG] = _____ cpm VDG-R-1480 G

R-219 (Gas Channel)

[X-133] [CAL FACT X-133] [FM] • [BKG] = _____ cpm HP-R-219G

R-219 FLOW CFM .

R-219 (Iodine Channel)

[I-131] [CAL FACT I-131] [filt. fact] [V] • [BKG]

-219 Flow CFM

_____ cpm HP-R-219I

R-219 (Particulate Channel)

[I-137] [CAL FACT] [filt. fact] [V] • [BKG]

219 FLOW CFM

_____ cpm HP-R-219P

ESTIMATED READINGS OF HP-R-225 and HP-R-226

ATED.

34 GAS CHANNEL

[µ Ci/cc X-133] [FM FLOW out STACK] [CAL FACTOR X-133] • [BKG]

= _____ cpm HP-R-226G

= _____ cpm HP-R-226G

35 IODINE CHANNEL

[µ Ci/cc I-131] [FILT. FACT.] [V FLOW out STACK] [CAL FACT. I-131] • [BKG]

= _____ cpm HP-R-226I

= _____ cpm HP-R-226I

TCN# 2-79-65

36 PARTICULATE CHANNEL

[µ Ci/cc Cs-137] [FILT. FACT.] [V FLOW out STACK] [CAL FACTOR Cs 137] • [BKG]

= _____ cpm HP-R-226P

= _____ cpm HP-R-226P

CAL FACTORS ARE AVAILABLE IN CONTROL ROOM

206 064

Total Noble Gas and Tritium Concentrations During Reactor Building Purges

The following sections will be filled out for reactor building purges only.

(46) Total in-leakage Time:

Time Purge Stopped _____ Time _____ Date

Time of Original Rx Sample _____ Time _____ Date

Total Time _____ Min.

(47) Total in-leakage Volume:

Volume = _____ CFM x _____ min x 2.832×10^4 = _____ cc

(48) Isotope	(49) Specific Activity ($\frac{\mu Ci}{cc}$)	(50) MPC	(51) $\frac{S.A}{MPC}$	(53) Additional Curies due to In-Leakage	(54) Qty. Released from (45)	(55) Actual Qty. Released, including in-leakage

(52) Σ = _____

(56) Total From (52)	(57) Volume Released (47)	(58) Quantity this Release	Qrtrly. Release Allotment	(59) % Allotment This Release
	cc	cc	1.9×10^{16} cc	

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TMI DOCUMENTS

DOCUMENT NO: TM-544

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Supervisor, Document Control, NRC