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RAFT

DUN-5558 RD

Hanford Category C-65

This document classified by:

A. E. Guay

Distribution

1. L. J. Newell

FUEL FAILURE REPORTS - 1968-1969

March 1, 1969

L. J. Newell
Reactor Fuels Unit

DUN RECORDS DISPOSITION

Indefinite Retention

Destruction Date

Authority

Until facility is abandoned
B-5-2

DISCLAIMER

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OR CHANGED TO *Declassified*
BY AUTHORITY OF *RLO-CB-4*
BY *SE. Hansen* DATE *11-9-89*
ED Naha 4/10/90
Spungfug

GROUP 1

Excluded from automatic downgrading and declassification.

MASTER

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ROUGH DRAFT

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DUN-5558 RD

COPY 1 OF

CONTINUOUS PAGINATION FOR

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54-3000-583 (8. 68)
AEC-RL RICHLAND, WASH.

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After Fill-In

HW

Page

Failure No. _____
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

- *1. Area 100 - KE
*2. Tube Number 0174
*3. Date Failed 6-2-70
*4. Date Charged 10-29-69
*5. Lot Number TC 021 H category A
*6. Type Failure _____
*7. Type Metal (Check one)
- Rupture Confirmed ☒
Stuck Charge Only (No Rupture) ☐
Bubbler ☐

I&E Natural

I&E Enriched

Nonbumper ☐

Nonbumper ☐

Bumper ☐

Bumper ☐

Self-support ☐

Self-support ☐

Other thoria K&T powder

8. Charge Make Up 38 Smooth thoria K&T
(Pieces of each type metal, from front end)
9. Production Test No. _____ Stuck ☐
Not Stuck ☒
10. Slug Position unknown

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 13.1
*12. Tube ΔT 8.5
*13. Tube Flow 29.1
*14. Tube Orifice Zone 14

15. Did rupture cause a tube leak NO
16. Did tube contain a poison spline NO
17. Mixer Location NOISE
18. Date Tube Installed 4-17-55
19. CWT 52.6

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Water samples taken and set to 200 area @ 0455
hours. One sample had Krypton 87 and Pu 234. Panellit
had increased 6 psi above like charges. 107 activity up slight.

21. Time from first rupture indication to shutdown (minutes) approx. 4 hours
22. Rear pigtail reading (units) _____

*Telephone this information as it becomes available.

(Over)

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HW _____
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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☒
25. If quickie failed, why
a. Cap stuck	☐	d. Insufficient reactivity	☐
b. Charge stuck	☐	e. Other (explain)	☐
c. Equipment failure	☐		
- Explain _____
26. If not quickied,
- a. Discharged with charge machine ☒
- b. Discharged with other equipment (explain) _____
- c. Force required for removal, if stuck _____
27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture _____
28. Remarks Discharged metal was inspected by Jack Goodenow
The element was split from the weld end approximately
1/2 way. The end cap was swollen - no scratch was
"weld failure". The rupture was immediately caused
29. Sketch (indicate data end)

Inspected by: (J. Goodenow)

Approved: X. N. Cummings
Area Engineer

cc: PAU File-Rupture Analyst (2)
Area File

A-5300-01 (2-64)

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HW

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Failure No.
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

- *1. Area KE
 *2. Tube Number 4951
 *3. Date Failed 8-24-69
 *4. Date Charged 5-24-69
 *5. Lot Number VGG 035E
 *6. Type Failure SG
 *7. Type Metal (Check one)

Rupture Confirmed ☒
 Stuck Charge Only
 (No Rupture) ☐
 Bubbler ☐

Pile Power 3735
 Tube Power 1809

I&E Natural

I&E Enriched

Nonbumper ☐
 Bumper ☐
 Self-support ☐
 Other ☐

Nonbumper ☒
 Bumper ☐
 Self-support ☒

8. Charge Make Up 51 KES
 (Pieces of each type metal, from front end)
 9. Production Test No. Stuck ☐
 Not Stuck ☐
 10. Slug Position U.N.K.

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 19.8
 *12. Tube ΔT 95.2
 *13. Tube Flow 72.2
 *14. Tube Orifice Zone 01 11.5
19.8

15. Did rupture cause a tube leak NO
 16. Did tube contain a poison spline NO
 17. Mixer Location NONE
 18. Date Tube Installed Fr
 19. CWT
 20. How detected (gamma monitor, filtered sample, Pancellit increase, etc.)
Gamma monitor tripped @ 0630 8-24-69 - Core 4951
up 2 psi - sample neg @ 0630 - 0830 filter
sample 10:1 - No increase noted @ 107 Inlet
 21. Time from first rupture indication to shutdown (minutes) 150 min
 22. Rear pigtail reading (units) 100 R. on bottom side of neck

*Telephone this information as it becomes available.

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III

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐
25. If quickie failed, why
a. Cap stuck	☐	d. Insufficient reactivity	☐
b. Charge stuck	☐	e. Other (explain)	☐
c. Equipment failure	☐		
- Explain _____
26. If not quickied,
- a. Discharged with charge machine ☐
- b. Discharged with other equipment (explain) ☒ Backtested
- then disch w/ chg machine
- c. Force required for removal, if stuck _____
27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture _____
28. Remarks _____
29. Sketch (indicate data end) _____

Inspected by: _____

Approved: _____
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

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HW _____
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Failure No. _____
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT
Submit report for each rupture and stuck charge.

- *1. Area RF
*2. Tube Number 1551
*3. Date Failed 8/18/69 2100 hours
*4. Date Charged 5/24/69
*5. Lot Number V G G - 801 E
*6. Type Failure FM
*7. Type Metal (Check one)

<u>I&E Natural</u>	<u>I&E Enriched</u>
Nonbumper ☐	Nonbumper ☐
Bumper ☐	Bumper ☐
Self-support ☐	Self-support ☒
Other _____	

Rupture Confirmed ☒
Stuck Charge Only ☐
(No Rupture)
Bubbler ☐

8. Charge Make Up SI KSE
(Pieces of each type metal, from front end)
9. Production Test No. _____ Stuck ☐
Not Stuck ☒
10. Slug Position _____

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 190
*12. Tube ΔT 90
*13. Tube Flow 700
*14. Tube Orifice Zone 01

15. Did rupture cause a tube leak NO
16. Did tube contain a poison spline NO
17. Mixer Location WONGE
18. Date Tube Installed _____
19. CWT _____

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)

L-45 Gamma Monitor, Panellit Pressure up 0.25 psi,
107 inlet up 10 m2/hour

21. Time from first rupture indication to shutdown (minutes) 21 minutes
22. Rear pigtail reading (units) 250 R/hour

*Telephone this information as it becomes available.

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HW
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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐
25. If quickie failed, why
- a. Cap stuck ☐
- b. Charge stuck ☐
- c. Equipment failure ☐
Explain _____
- d. Insufficient reactivity ☐
- e. Other (explain) _____
26. If not quickied,
- a. Discharged with charge machine ☐
- b. Discharged with other equipment (explain) ☐ _____
- c. Force required for removal, if stuck _____
27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture DISRU
28. Remarks _____
29. Sketch (indicate data end) _____

MALE END CAP
MISSING

slight groove
& ledge
corrosion

Inspected by: DO Green

Approved: DO Green
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

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Failure No. _____
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT
Submit report for each rupture and stuck charge.

- *1. Area 105 KE
*2. Tube Number 2074
*3. Date Failed 8-12-69
*4. Date Charged 8-27-69
*5. Lot Number 66014D 31E
*6. Type Failure SEL
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only
(No Rupture) ☐
Bubbler ☐

I&E Natural

I&E Enriched

Nonbumper ☐
Bumper ☐
Self-support ☐
Other _____

Nonbumper ☐
Bumper ☐
Self-support ☒

8. Charge Make Up 51 KSAFA ADS (new style, small
(Pieces of each type metal, from front end)
9. Production Test No. 011 Stuck ☐
Not Stuck ☐ core, thicker cladding)
10. Slug Position 6

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 19.2
*12. Tube ΔT 97
*13. Tube Flow 650 w
*14. Tube Orifice Zone 01

15. Did rupture cause a tube leak _____ 18. Date Tube
16. Did tube contain a poison spline _____ Installed _____
17. Mixer Location none 19. CWT _____

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
gamma monitor, Panellit pressure up 4 psi

21. Time from first rupture indication to shutdown (minutes) 75 minutes
22. Rear pigtail reading (units) _____

*Telephone this information as it becomes available.

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐

25. If quickie failed, why

- a. Cap stuck ☐
b. Charge stuck ☐
c. Equipment failure ☐
Explain _____

- d. Insufficient reactivity ☐
e. Other (explain) ☐

26. If not quickied,

- a. Discharged with charge machine
b. Discharged with other equipment, (explain) _____
c. Force required for removal, if stuck _____

*broken lead with
machine*

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture _____

28. Remarks _____

29. Sketch (indicate data end)

Inspected by: TA GREEN

Approved: TA GREEN
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

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Failure No. _____
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT
Submit report for each rupture and stuck charge.

- *1. Area 100-KW
*2. Tube Number 2359
*3. Date Failed 7-20-69
*4. Date Charged 6-13-69
*5. Lot Number _____
*6. Type Failure endcap failure
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only ☐
(No Rupture)
Bubbler ☐

I&E Natural

I&E Enriched

Nonbumper ☐
Bumper ☐
Self-support ☐
Other Neptunium-graphite matrix; gr. clad.

Nonbumper ☐
Bumper ☐
Self-support ☐

8. Charge Make Up 16 S.A. dummies, 6 Nep. Graph., 16 S.A. dummies
(Pieces of each type metal, from front end)
9. Production Test No. PTA-163 Stuck ☐
Not Stuck ☒
10. Slug Position G2-36

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 17.6
*12. Tube ΔT 16.4
*13. Tube Flow 18.8
*14. Tube Orifice Zone 16

15. Did rupture cause a tube leak no 18. Date Tube 2irc Tube
16. Did tube contain a poison spline no Installed _____
17. Mixer Location none 19. CWT _____
20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Rupture not detected prior to being discharged.

21. Time from first rupture indication to shutdown (minutes) _____
22. Rear pigtail reading (units) _____

*Telephone this information as it becomes available.

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☒

25. If quickie failed, why

- a. Cap stuck ☐
b. Charge stuck ☐
c. Equipment failure ☐

- d. Insufficient reactivity ☐
e. Other (explain) ☐

Explain _____

26. If not quickied,

- a. Discharged with charge machine
b. Discharged with other equipment (explain) ☒

c. Force required for removal, if stuck _____

Discharged with

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture None

28. Remarks Female endcap missing

29. Sketch (indicate data end)

Inspected by: _____

Approved: _____
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

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HW

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Failure No. _____
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

- *1. Area 100-KW
*2. Tube Number 2358
*3. Date Failed 7-19-69
*4. Date Charged 6-13-69
*5. Lot Number _____
*6. Type Failure Endcap failure
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only
(No Rupture) ☐
Bubbler ☐

I&E Natural

I&E Enriched

Nonbumper ☐
Bumper ☐
Self-support ☐
Other Neptunium - Graphite Matrix; al. clad.

Nonbumper ☐
Bumper ☐
Self-support ☐

8. Charge Make Up 16 S.A. dummies, 6 Nep-Graph, 16 S.A. dummies
(Pieces of each type metal, from front end)
9. Production Test No. PTA-163 Stuck ☐
Not Stuck ☒
10. Slug Position GA-22, -24, -26, -23, -21, -25

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 17.6
*12. Tube ΔT 18.4
*13. Tube Flow 19.5 gpm.
*14. Tube Orifice Zone 46

15. Did rupture cause a tube leak no 18. Date Tube Zinc Tube
16. Did tube contain a poison spline no Installed _____
17. Mixer Location none 19. CWT _____

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
3 major divisions on gamma monitor; individual sample lines on 2358, 2359; swabbed the perfs.

21. Time from first rupture indication to shutdown (minutes) unknown
22. Rear pigtail reading (units) unknown

*Telephone this information as it becomes available.

(Over)

A-5300-021 a-ea)

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HW _____
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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☒

25. If quickie failed, why

- a. Cap stuck ☐
b. Charge stuck ☐
c. Equipment failure ☐
Explain _____

- d. Insufficient reactivity ☐
e. Other (explain) ☐

26. If not quickied,

- a. Discharged with charge machine
b. Discharged with other equipment (explain) ☒ ram seater

c. Force required for removal, if stuck _____

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture None

28. Remarks all female endcaps missing

29. Sketch (indicate data end)

Inspected by: _____

Approved: _____
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

A-5300-021 (2-64)

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L.S. Newell

547-5689

PASCO

After Fill-In

HW

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Failure No. 1823
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

*1. Area KF
*2. Tube Number 3457
*3. Date Failed 7-3-69
*4. Date Charged 3-27-69
*5. Lot Number PT-159
*6. Type Failure Full surface corrosion
*7. Type Metal (Check one) Exhibiting corrosion
I&E Natural ☐ I&E Enriched ☐
Nonbumper ☐ Nonbumper ☐
Bumper ☐ Bumper ☐
Self-support ☐ Self-support ☒
Other ☐

8. Charge Make Up KFH, 44 pc. K5AFA, 7 pc. K5AE
(Pieces of each type metal, from front end)9. Production Test No. 159 Stuck ☐
Not Stuck ☐10. Slug Position CE

(From latest equilibrium or near-equilibrium operating period)

*11. Inlet Temperature 17.0°C
*12. Tube ΔT 99.9°C
*13. Tube Flow 71.9 gpm
*14. Tube Orifice Zone 101

15. Did rupture cause a tube leak no 18. Date Tube Installed 21 Dec 1968
16. Did tube contain a poison spline no
17. Mixer Location NOVU 19. CWT

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Gamma Monitor (R-34), water sample

21. Time from first rupture indication to shutdown (minutes) ~240
22. Rear pigtail reading (units) 100 R/NOVU

*Telephone this information as it becomes available.

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HW

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23. Quickie Attempted Yes ☐ No ☒

24. Quickie Successful Yes ☐ No ☐

25. If quickie failed, why

a. Cap stuck ☐

b. Charge stuck ☐

c. Equipment failure ☐

Explain _____

d. Insufficient reactivity ☐

e. Other (explain) ☐

26. If not quickied,

a. Discharged with charge machine ☐

b. Discharged with other equipment (explain) ☐

c. Force required for removal, if stuck _____

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture none

28. Remarks _____

29. Sketch (indicate data end)

← WATER

Inspected by: J.P. Serrano

Approved: [Signature]
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

A-5300-021 (2-64)

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power level 2235
tube power 2288
Exposure 1600

HW
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Failure No. 1822
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

- *1. Area 105-C
*2. Tube Number 2863
*3. Date Failed 4-25-69
*4. Date Charged 5-20-68
*5. Lot Number
*6. Type Failure
*7. Type Metal (Check one)

I&E Natural

Rupture Confirmed ☒
Stuck Charge Only ☐
(No Rupture)
Bubbler ☐

I&E Enriched

Nonbumper ☐
Bumper ☐
Self-support ☐
Other

Nonbumper ☒
Bumper ☒
Self-support ☐

8. Charge Make Up 32 CMIE

(Pieces of each type metal, from front end)

9. Production Test No. 103

Stuck ☐
Not Stuck ☒

10. Slug Position

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 9.4
*12. Tube ΔT 96.6
*13. Tube Flow 87.9
*14. Tube Orifice Zone 03

15. Did rupture cause a tube leak NO
16. Did tube contain a poison spline NO
17. Mixer Location NONE

18. Date Tube Installed 1-17-68
19. CWT 40.0

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)

gamma monitor, filtered sample

21. Time from first rupture indication to shutdown (minutes) 220 min

22. Rear pigtail reading (units)

*Telephone this information as it becomes available.

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐

25. If quickie failed, why

- a. Cap stuck ☐
b. Charge stuck ☐
c. Equipment failure ☐
Explain _____

- d. Insufficient reactivity ☐
e. Other (explain) _____

26. If not quickied,

- a. Discharged with charge machine ☒
b. Discharged with other equipment (explain) _____

c. Force required for removal, if stuck 1" over bore charge machine

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture NONE

28. Remarks this tube was ~ 160% of goal. the downstream pieces show a degree of corrosion expected at this level of exposure.

29. Sketch (indicate data end)

Inspected by: _____

Approved: R.D. Williams
Area Engineer

cc: PAU Filo-Rupture Analyst (2),
Area File

A-5300-021 (2-64)

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HW

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Poison level 1800
tube power 1789

Failure No. 1821
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

*1. Area 105-C
*2. Tube Number 2864
*3. Date Failed 3/22/69
*4. Date Charged 1/19/68
*5. Lot Number 79W
*6. Type Failure _____
*7. Type Metal (Check one)
I&E Natural _____ I&E Enriched _____
Nonbumper ☐ Nonbumper ☒
Bumper ☐ Bumper ☐
Self-support ☐ Self-support ☐
Other _____
Rupture Confirmed ☒
Stuck Charge Only (No Rupture) ☐
Bubbler ☐

8. Charge Make Up 32 CM2E
(Pieces of each type metal, from front end)
9. Production Test No. PT 10.3 Stuck ☒
Not Stuck ☐
10. Slug Position 5th

(From latest equilibrium or near-equilibrium operating period)

*11. Inlet Temperature 5.2
*12. Tube ΔT 81.8
*13. Tube Flow 83.0
*14. Tube Orifice Zone 09

15. Did rupture cause a tube leak _____ 18. Date Tube
16. Did tube contain a poison spline NO Installed 1/19/68
17. Mixer Location NONE 19. CWT 6.5

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
gamma monitor

21. Time from first rupture indication to shutdown (minutes) _____
22. Rear pigtail reading (units) _____

*Telephone this information as it becomes available.

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☒
25. If quickie failed, why
- a. Cap stuck ☐
- b. Charge stuck ☐
- c. Equipment failure ☐
- Explain _____
- d. Insufficient reactivity ☐
- e. Other (explain) _____
26. If not quickied,
- a. Discharged with charge machine ☐
- b. Discharged with other equipment (explain) ☒ charge was
- back sealed and ribs cut
- c. Force required for removal, if stuck 4500 # Rock pusher
27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture NONE
28. Remarks _____
29. Sketch (indicate data end) _____

Inspected by: _____

Approved: R.D. Williams
Area Engineer

cc: PAU Filo-Rupture Analyst (?),
Area File

A-5300-021 (2-64)

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HW ~~40~~

Page 40

power level - 2280

tube exposure 2185 MIN

Failure No. 1820
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

- *1. Area 105-C
*2. Tube Number 2690
*3. Date Failed 3/20/69
*4. Date Charged 6/9/68
*5. Lot Number QJQ120
*6. Type Failure _____
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only
(No Rupture) ☐
Bubbler ☐

I&E Natural

I&E Enriched

Nonbumper ☒
Bumper ☒
Self-support ☐
Other _____

Nonbumper ☐
Bumper ☐
Self-support ☐

8. Charge Make Up 10-03N, 5-03NB, 1-03W, 8-C2NB, 1-C2W, 7-C2N
(Pieces of each type metal, from front end)

9. Production Test No. 127 Stuck ☐
Not Stuck ☒

10. Slug Position _____

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 4.4
*12. Tube ΔT 112.6
*13. Tube Flow 50.5
*14. Tube Orifice Zone 01

15. Did rupture cause a tube leak _____
16. Did tube contain a poison spline NO
17. Mixer Location 8th & 17th

18. Date Tube Installed 05, 25-62
19. CWT 44

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
gamma monitor, panellit increase

21. Time from first rupture indication to shutdown (minutes) 10
22. Rear pigtail reading (units) _____

*Telephone this information as it becomes available.

(Over)

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☒

25. If quickie failed, why

- a. Cap stuck ☐
b. Charge stuck ☐
c. Equipment failure ☐
Explain _____

- d. Insufficient reactivity ☐
e. Other (explain) ☐

26. If not quickied,

- a. Discharged with charge machine
b. Discharged with other equipment (explain) ☒ 3400#

c. Force required for removal, if stuck _____

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture NONE

28. Remarks _____

29. Sketch (indicate data end) _____

Inspected by: _____

Approved: R D Wellman
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

A-5300-021 (1-64)

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Failure No. 1819
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

*1. Area 105-C
*2. Tube Number 3364
*3. Date Failed 2/27/69
*4. Date Charged 8745
*5. Lot Number
*6. Type Failure
*7. Type Metal (Check one)

<u>I&E Natural</u>	☐	<u>I&E Enriched</u>	☐
Nonbumper	☐	Nonbumper	☒
Bumper	☐	Bumper	☐
Self-support	☐	Self-support	☐
Other <u> </u>	☐		☐

8. Charge Make Up 22 CM2E
(Pieces of each type metal, from front end)
9. Production Test No. PTA-103
10. Slug Position 4th
Stuck ☒
Not Stuck ☐

(From latest equilibrium or near-equilibrium operating period)

*11. Inlet Temperature 3.2
*12. Tube ΔT 99.8
*13. Tube Flow 84.8
*14. Tube Orifice Zone 09

15. Did rupture cause a tube leak Yes
16. Did tube contain a poison spline No
17. Mixer Location None
18. Date Tube Installed 11/19/68
19. CWT 62.2

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
gamma monitor

21. Time from first rupture indication to shutdown (minutes)
22. Rear pigtail reading (units)

*Telephone this information as it becomes available.

(Over)

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐
25. If quickie failed, why
a. Cap stuck	☐	d. Insufficient reactivity	☐
b. Charge stuck	☐	e. Other (explain)	☐
c. Equipment failure	☐		
- Explain _____
26. If not quickied,
- a. Discharged with charge machine ☐
- b. Discharged with other equipment (explain) ☒ _____
- c. Force required for removal, if stuck 4600 #
27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture 10/1/11
28. Remarks _____
29. Sketch (indicate data end) _____

Inspected by: _____

Approved: RDC
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

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Failure No. 18/8
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

*1. Area KE
*2. Tube Number 4456
*3. Date Failed 1-11-69
*4. Date Charged 11-03-68
*5. Lot Number DEF 019 B
*6. Type Failure SH
*7. Type Metal (Check one)

<u>I&E Natural</u>	<u>I&E Enriched</u>
Nonbumper ☒	Nonbumper ☐
Bumper ☐	Bumper ☐
Self-support ☐	Self-support ☐
Other ☐	

8. Charge Make Up 38 KIVN
(Pieces of each type metal, from front end)
9. Production Test No. PIA 030 Stuck ☒
Not Stuck ☐
10. Slug Position 8th

(From latest equilibrium or near-equilibrium operating period)

*11. Inlet Temperature 5.2
*12. Tube ΔT 91.8
*13. Tube Flow 56.3
14. Tube Orifice Zone 05

15. Did rupture cause a tube leak NO
16. Did tube contain a poison spline NO
17. Mixer Location NONE
18. Date Tube Installed 5-28-68
19. CWT 74.7

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Gamma Monitor went full scale - Gage increased 10 psi
from 1st indication on G. M. until shutdown - 107 INK +
increased from 150 MR + 75 MR - Riser Differential showed no change

21. Time from first rupture indication to shutdown (minutes) ~ UNK.
22. Rear pigtail reading (units) 52 at rail

*Telephone this information as it becomes available.

(Over)

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☒
25. If quickie failed, why
a. Cap stuck	☐	d. Insufficient reactivity	☐
b. Charge stuck	☐	e. Other (explain)	☐
c. Equipment failure	☐		
- Explain _____
26. If not quickied,
- a. Discharged with charge machine ☐
- b. Discharged with other equipment (explain) ☒ Attempt to backseat at 6000 # unsuccessful. Cut ribs in rear after flaking - Dischg. at 4,500 #
- c. Force required for removal, if stuck 6,000 #

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture _____

28. Remarks _____

29. Sketch (indicate data end)

Inspected by: R. J. Bartlett

Approved: [Signature]
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

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Failure No. 1817
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

- *1. Area 105-C
*2. Tube Number 2868
*3. Date Failed 12/22/68
*4. Date Charged 5/21/68
*5. Lot Number FH-003 F
*6. Type Failure
*7. Type Metal (Check one)
I&E Natural I&E Enriched
Nonbumper ☐ Nonbumper ☐
Bumper ☐ Bumper ☐
Self-support ☐ Self-support ☐
Other OVERBORE
- Rupture Confirmed ☒
Stuck Charge Only (No Rupture) ☐
Bubbler ☐

8. Charge Make Up 32 CMIE
(Pieces of each type metal, from front end)
9. Production Test No. 103 Stuck ☒
Not Stuck ☐
10. Slug Position 3 & 4

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 8.4
*12. Tube ΔT 108.6
*13. Tube Flow 86.0
14. Tube Orifice Zone 09

15. Did rupture cause a tube leak yes 18. Date Tube Installed 1-19-68
16. Did tube contain a poison spline NO 19. CWT 40
17. Mixer Location NONE

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
gamma monitor, filtered sample, and panellit increase

21. Time from first rupture indication to shutdown (minutes)
22. Rear pigtail reading (units) 700R

*Telephone this information as it becomes available.

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☒
25. If quickie failed, why
a. Cap stuck	☐	d. Insufficient reactivity	☐
b. Charge stuck	☐	e. Other (explain)	☐
c. Equipment failure	☐		
- Explain _____
26. If not quickied,
- a. Discharged with charge machine ☐
- b. Discharged with other equipment (explain) ☒ Rank Pusher
- c. Force required for removal, if stuck 2200 #
27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture NONE
28. Remarks There were two fuel elements which had ruptures
29. Sketch (indicate data end)

Inspected by: _____

Approved: R.D. Williams
Area Engineer

cc: PAU File-Rupture Analyst (?),
Area File

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Failure No.

T27

(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

- *1. Area KW
*2. Tube Number 4878
*3. Date Failed Dec 18 1968
*4. Date Charged June 7 1968
*5. Lot Number TC-0102-H
*6. Type Failure SD
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only ☐
(No Rupture)
Bubbler ☒

I&E Natural

I&E Enriched

Nonbumper ☐
Bumper ☐
Self-support ☐
Other Thoria

Nonbumper ☐
Bumper ☐
Self-support ☐

8. Charge Make Up 38 pc. Thoria
(Pieces of each type metal, from front end)

9. Production Test No. _____ Stuck ☐
Not Stuck ☒

10. Slug Position _____

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 7.1
*12. Tube ΔT 7.9
*13. Tube Flow 27.8
*14. Tube Orifice Zone 14

15. Did rupture cause a tube leak No
16. Did tube contain a poison spline No
17. Mixer Location None

18. Date Tube Installed 3-11-55
19. CWT 55.8

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Panellit - 4" increase over previous 2 days, increased to full scale & screened re
Gamma Monitor - slight indications off on for some period on time,
full scale w/ hr before screen, dropped to 50% of scale, full scale 5 min before

21. Time from first rupture indication to shutdown (minutes) 5 min
22. Rear pigtail reading (units) None taken

*Telephone this information as it becomes available.

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐
25. If quickie failed, why
- a. Cap stuck ☐
- b. Charge stuck ☐
- c. Equipment failure ☐
- d. Insufficient reactivity ☐
- e. Other (explain) ☐
26. If not quickied,
- a. Discharged with charge machine ☒
- b. Discharged with other equipment (explain) ☐
- c. Force required for removal, if stuck ☐

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture None

28. Remarks Three ruptures were found, all with significant damage - Several other slugs shown on mech. damage but to the numbered end instead of the weld end that all the ruptures occurred on

29. Sketch (indicate data end)

Inspected by: R. G. Bartlett

Approved: L. J. Morrison
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

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Failure No. T 26
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

*1. Area 105 KW
*2. Tube Number 5791 Rupture Confirmed ☒
*3. Date Failed 11-25-68 Stuck Charge Only ☐
*4. Date Charged 06-07-68 (No Rupture)
*5. Lot Number TC 1094 Bubbler ☐
*6. Type Failure SD
*7. Type Metal (Check one)
I&E Natural I&E Enriched
Nonbumper ☐ Nonbumper ☐
Bumper ☐ Bumper ☐
Self-support ☐ Self-support ☐
Other THORIA (SMOOTH)

8. Charge Make Up 38 pcs THORIA
(Pieces of each type metal, from front end)
9. Production Test No. _____ Stuck ☐
Not Stuck ☒

(From latest equilibrium or near-equilibrium operating period)

*11. Inlet Temperature 10.7
*12. Tube ΔT 09.3
*13. Tube Flow 28.3
*14. Tube Orifice Zone 14

15. Did rupture cause a tube leak NO 18. Date Tube
16. Did tube contain a poison spline NO Installed _____
17. Mixer Location NONE 19. CWT _____

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Header water samples - Lab Analysis (KRYPTON)
Slight Gamma Monitor Indication
4# Increase on Panellit Gauge

21. Time from first rupture indication to shutdown (minutes) _____
22. Rear pigtail reading (units) NONE TAKEN

*Telephone this information as it becomes available.

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27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture NONE
28. Remarks TUBE CONTAINED 4 RUPTURES plus 6 OTHERS THAT APPEARED TO HAVE SLIGHT CHARGING DAMAGE
ALL 4 of the Ruptures giving off gas

2. AL. Can Folded Back

DATA
END

OTHER TWO RUPTURES SIMILAR TO # 2

Approved: _____
Area Engineer

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Failure No. 1816
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT
Submit report for each rupture and stuck charge.

- *1. Area 100-B
*2. Tube Number 1664
*3. Date Failed 10/24/68
*4. Date Charged 4/17/68
*5. Lot Number 450019
*6. Type Failure HL
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only (No Rupture) ☐
Bubbler ☐

I&E Natural

I&E Enriched

Nonbumper ☐
Bumper ☒
Self-support ☐
Other ☐

Nonbumper ☐
Bumper ☐
Self-support ☐

8. Charge Make Up 31 + 1 C3NAB
(Pieces of each type metal, from front end)

9. Production Test No. 011

Stuck ☐
Not Stuck ☒

10. Slug Position 3, 4, and 5

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 15.6
*12. Tube ΔT 106.4
*13. Tube Flow 49.9
*14. Tube Orifice Zone 01

15. Did rupture cause a tube leak No
16. Did tube contain a poison spline No
17. Mixer Location 5th

18. Date Tube Installed 8/5/62
19. CWT 48.5

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
gamma monitor

21. Time from first rupture indication to shutdown (minutes) 4 days
22. Rear pigtail reading (units) 100 R

*Telephone this information as it becomes available.

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☒
25. If quickie failed, why
a. Crp stuck	☐	d. Insufficient reactivity	☐
b. Charge stuck	☐	e. Other (explain)	☐
c. Equipment failure	☐		
- Explain _____
26. If not quickied,
- a. Discharged with charge machine ☒
- b. Discharged with other equipment (explain) _____
- c. Force required for removal, if stuck _____
27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture NONE
28. Remarks Some fuel element had evidence of being guided back at top side. Some evidence of external corrosion.
29. Sketch (indicate data end) _____

Inspected by: _____

Approved: R.D. Williams
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

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Failure No. 1815
(Fill in at 1704-B)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

*1. Area 105-C
*2. Tube Number 3190
*3. Date Failed 10-5-68
*4. Date Charged 8516
*5. Lot Number 94-X
*6. Type Failure Cave split
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only ☐
(No Rupture)
Bubbler ☐

I&E Natural

I&E Enriched

Nonbumper ☐
Bumper ☐
Self-support ☐
Other ☐

Nonbumper ☐
Bumper ☒
Self-support ☐

8. Charge Make Up 30 + 1
(Pieces of each type metal, from front end)
9. Production Test No. 098
10. Slug Position 17th

Stuck ☒
Not Stuck ☐

(From latest equilibrium or near-equilibrium operating period)

*11. Inlet Temperature 17.4
*12. Tube ΔT 51.6
*13. Tube Flow 56.8
*14. Tube Orifice Zone 01

Power level 2135
TS 1221

15. Did rupture cause a tube leak No
16. Did tube contain a poison spline No
17. Mixer Location 9th
18. Date Tube Installed 5-25-62
19. CWT 17.3

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
gamma monitor, filtered sample, 6# panellit
increase

21. Time from first rupture indication to shutdown (minutes) 8 min
22. Rear pigtail reading (units)

*Telephone this information as it becomes available.

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☒
25. If quickie failed, why
- a. Cap stuck ☐
- b. Charge stuck ☐
- c. Equipment failure ☐
- Explain _____
- d. Insufficient reactivity ☐
- e. Other (explain) ☐
- _____
- _____
26. If not quickied,
- a. Discharged with charge machine ☐
- b. Discharged with other equipment (explain) ☒
- _____
- c. Force required for removal, if stuck 4500
-
27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture NONE
28. Remarks rest of fuel elements in expected condition
- _____
- _____
29. Sketch (indicate data end)
- _____

Inspected by: _____

Approved: R.D. Williams
Area Engineer

cc: PAU Fille-Rupture Analyst (?),
Area File

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐
25. If quickie failed, why
a. Cap stuck	☐	d. Insufficient reactivity	☐
b. Charge stuck	☐	e. Other (explain)	☐
c. Equipment failure	☐		
- Explain _____
26. If not quickied,
a. Discharged with charge machine	☐
b. Discharged with other equipment (explain)	☐
- c. Force required for removal, if stuck _____

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture _____

28. Remarks _____

29. Sketch (indicate data end) _____

Inspected by: P. T. [unclear]

Approved: _____
Area Engineer

cc: PAU File-Rupture Analyst (2)
Area File

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Failure No. 1813
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

- *1. Area KE Reactor
*2. Tube Number 5073
*3. Date Failed August 4, 1968
*4. Date Charged 5-23-68
*5. Lot Number KC 443 DP
*6. Type Failure note
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only ☐
(No Rupture)
Bubbler ☐

I&E Natural

I&E Enriched

Nonbumper ☐Nonbumper ☐Bumper ☐Bumper ☐Self-support ☐Self-support ☒

Other _____

8. Charge Make Up 51 KSE
(Pieces of each type metal, from front end)

9. Production Test No. _____ Stuck ☐
Not Stuck ☒

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 13.9
*12. Tube AT 90
*13. Tube Flow 76.6
*14. Tube Orifice Zone 1

15. Did rupture cause a tube leak _____ 18. Date Tube
16. Did tube contain a poison spline no Installed _____
17. Mixer Location none 19. CWT _____

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Panellit trip high, only 7 psi high after trip
full scale gamma monitor

21. Time from first rupture indication to shutdown (minutes) 0
22. Rear pigtail reading (units) 508

*Telephone this information as it becomes available.

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐
25. If quickie failed, why
- a. Cap stuck ☐
- b. Charge stuck ☐
- c. Equipment failure ☐
- Explain _____
- d. Insufficient reactivity ☐
- e. Other (explain) ☐
- _____
26. If not quickied,
- a. Discharged with charge machine ☒
- b. Discharged with other equipment (explain) ☐
- _____
- c. Force required for removal, if stuck _____

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture none

28. Remarks picked up at
1. riser coil differential count rate meter
2. 107 inbt
3. rear face beckman but not gamma meter

29. Sketch (indicate data end)
- system before system was shut down
- after scram.

Inspected by: _____

Approved: TA GREEN

Area Engineer

cc: PAU File-Rupture Analyst (2)

Area File

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Failure No. 1814
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT
Submit report for each rupture and stuck charge.

*1. Area KE REACTOR
*2. Tube Number 3581 Rupture Confirmed ☒
*3. Date Failed Sept 18, 1968 Stuck Charge Only ☐
*4. Date Charged May 25, 1968 (No Rupture)
*5. Lot Number K6 444-D Bubbler ☐
*6. Type Failure hole failure
*7. Type Metal (Check one)
I&E Natural I&E Enriched
Nonbumper ☐ Nonbumper ☐
Bumper ☐ Bumper ☐
Self-support ☐ Self-support ☒
Other _____

8. Charge Make Up 51 KSE (KES load code)
(Pieces of each type metal, from front end)
9. Production Test No. _____ Stuck ☐
Not Stuck ☐

(From latest equilibrium or near-equilibrium operating period)

*11. Inlet Temperature 180°C
*12. Tube ΔT 91°C
*13. Tube Flow 73.2 gpm
*14. Tube Orifice Zone 1

15. Did rupture cause a tube leak _____ 18. Date Tube
16. Did tube contain a poison spline _____ Installed _____
17. Mixer Location none 19. CWT _____

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)

Panellit Scram

Heise before = 177

Heise after = 195 (both at TORP = 378)

21. Time from first rupture indication to shutdown (minutes) 0
22. Rear pigtail reading (units) NORMAL

*Telephone this information as it becomes available.

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Failure No. 1812
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

*1. Area 105 C
*2. Tube Number 3077
*3. Date Failed 7/10/68
*4. Date Charged 1/19/68
*5. Lot Number KC 386Q
*6. Type Failure C P
*7. Type Metal (Check one)
I&E Natural I&E Enriched
Nonbumper ☐ Nonbumper ☐
Bumper ☐ Bumper ☒
Self-support ☐ Self-support ☐
Other ☐

8. Charge Make Up 27 C3EB, 1C3WB, 7 C3EB
(Pieces of each type metal, from front end)

9. Production Test No. 078 Stuck ☐
Not Stuck ☒

10. Slug Position 20 FROM DOWNSTREAM END

(From latest equilibrium or near-equilibrium operating period)

*11. Inlet Temperature 17.8
*12. Tube ΔT 90.2
*13. Tube Flow 55.6 GPM
*14. Tube Orifice Zone 01

15. Did rupture cause a tube leak NO 18. Date Tube
16. Did tube contain a poison spline NO Installed 5/25/62
17. Mixer Location 8 FROM D.S. END 19. CWT 45.7 MIAS

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
gamma monitor, filtered sample

21. Time from first rupture indication to shutdown (minutes)
22. Rear pigtail reading (units)

*Telephone this information as it becomes available.

(Over)

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☒

25. If quickie failed, why

- a. Cap stuck ☐
b. Charge stuck ☐
c. Equipment failure ☐
Explain _____

- d. Insufficient reactivity ☐
e. Other (explain) ☐

26. If not quickied,

- a. Discharged with charge machine ☐
b. Discharged with other equipment (explain) ☒

c. Force required for removal, if stuck 4500#

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture _____

28. Remarks

THE REST OF THE CHARGE COLUMN LOOKED GOOD
FROM CORROSION STANDPOINT. SOME HOT SPOTS NOTED ON
PCS #4 TO #16. LOOKS LIKE RUPTURE BROKE IN TWO
PIECES DURING DISCHARGE

29. Sketch (indicate data end)

Inspected by: L. L. TANNWIKER

Approved: W. L. Williams
Area Engineer

cc: PAU File-Rupture Analyst (?),
Area File

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1-5300-02-100-04)

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HW 1811
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Failure No. 1811
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT
Submit report for each rupture and stuck charge.

*1. Area 105-C
*2. Tube Number 308 B
*3. Date Failed 6-17-68
*4. Date Charged 1-19-68
*5. Lot Number KC-286-D
*6. Type Failure Cave split
*7. Type Metal (Check one)

<u>I&E Natural</u>	<u>I&E Enriched</u>
Nonbumper ☐	Nonbumper ☐
Bumper ☐	Bumper ☒
Self-support ☐	Self-support ☐
Other ☐	

8. Charge Make Up 27 C3EB 1C3WB 7C3EB
(Pieces of each type metal, from front end)

9. Production Test No. 098 Stuck ☒
Not Stuck ☐

10. Slug Position 20" from down stream end

(From latest equilibrium or near-equilibrium operating period)

*11. Inlet Temperature 14.9

*12. Tube ΔT 95.1

*13. Tube Flow 58.7

18. Date Tube

Installed

19. CWT

ple, Panellit increase, etc.)

utdown (minutes)

lable.

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Page 17

23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐

25. If quickie failed, why

- a. Cap stuck ☐
b. Charge stuck ☐
c. Equipment failure ☐
Explain _____

- d. Insufficient reactivity ☐
e. Other (explain) ☐

26. If not quickied,

- a. Discharged with charge machine ☒
b. Discharged with other equipment (explain) ☐ moved 19" Rivet
try with charge machine flushed down stream metal
c. Force required for removal, if stuck ~~4500~~ 4500 pushed rupture

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture NONE

28. Remarks other metal looked in good shape
with very little corrosion

29. Sketch (indicate data end)

Inspected by: _____

Approved: _____
Area Engineer

cc: PAU File-Rupture Analyst (2),
Area File

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HW

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Failure No. 1810
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

- *1. Area KW
*2. Tube Number 1480
*3. Date Failed 5-22-68
*4. Date Charged 2-21-67
*5. Lot Number DEP 0130
*6. Type Failure once split (OT)
*7. Type Metal (Check one)
I&E Natural I&E Enriched
Nonbumper ☐ Nonbumper ☐
Bumper ☐ Bumper ☐
Self-support ☐ Self-support ☐
Other Depleted - self support
Rupture Confirmed ☐
Stuck Charge Only (No Rupture) ☐
Bubbler ☐
8. Charge Make Up 38 pcs Depleted
(Pieces of each type metal, from front end)
9. Production Test No. PTA-078
Stuck ☐
Not Stuck ☒

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 11.8
*12. Tube ΔT 74.2
*13. Tube Flow 676
*14. Tube Orifice Zone 01
15. Did rupture cause a tube leak No
16. Did tube contain a poison spline No
17. Mixer Location Along
18. Date Tube Installed _____
19. CWT _____
20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Gamma monitor - full scale, mixer d.f. present a1 reactor
increased 15% Panellit increased 15"
21. Time from first rupture indication to shutdown (minutes) ~ 15 min
22. Rear pigtail reading (units) 3 R

*Telephone this information as it becomes available.

(Over)

A-5300-021 (2-64)

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HW
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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐
25. If quickie failed, why
- a. Cap stuck ☐
- b. Charge stuck ☐
- c. Equipment failure ☐
- Explain _____
- d. Insufficient reactivity - ☐
- e. Other (explain) ☐
- _____
- _____
26. If not quickied,
- a. Discharged with charge machine ☒
- b. Discharged with other equipment (explain) ☐
- _____
- c. Force required for removal, if stuck _____

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture

28. Remarks

29. Sketch (indicate data end)

Inspected by: T. R. Morrison

Approved: [Signature]
Area Engineer

cc: PAU File-Rupture Analyst (?)
Area File

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Failure No. 1809
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT
Submit report for each rupture and stuck charge.

- *1. Area K-10
*2. Tube Number 1721
*3. Date Failed 2-18-68
*4. Date Charged 2-21-68
*5. Lot Number 1721-025
*6. Type Failure Corrosion (C-1)
*7. Type Metal (Check one)
<u>I&E Natural</u>	<u>I&E Enriched</u>
Nonbumper ☐	Nonbumper ☐
Bumper ☐	Bumper ☐
Self-support ☐	Self-support ☐
Other <u>Displacement - self support</u>	

Rupture Confirmed ☒
Stuck Charge Only ☐
(No Rupture)
Bubbler ☐

8. Charge Make Up 38 pcs 1721
(Pieces of each type metal, from front end)
9. Production Test No. PTA-048
Stuck ☐
Not Stuck ☒

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 122
*12. Tube ΔT 56.8
*13. Tube Flow 68.5
*14. Tube Orifice Zone 21

15. Did rupture cause a tube leak No
16. Did tube contain a poison spline No
17. Mixer Location None
18. Date Tube Installed _____
19. CWT _____

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Gamma Monitor full scale - Panellit increased
10" before screen bottom was reached

21. Time from first rupture indication to shutdown (minutes) ~15 min
22. Rear pigtail reading (units) 5 R at coil

*Telephone this information as it becomes available.

(Over)

A-5300-021 (2-64)

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11W

l'age

2

23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐
25. If quickie failed, why
- a. Cap stuck ☐
- b. Charge stuck ☐
- c. Equipment failure ☐
- Explain _____
- d. Insufficient reactivity ☐
- e. Other (explain) _____
26. If not quickied,
- a. Discharged with charge machine ☒
- b. Discharged with other equipment (explain) _____
- c. Force required for removal, if stuck _____
-
27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture 1/10/52
28. Remarks _____
29. Sketch (indicate data end)

Inspected by: RLB:tht

Approved: T. T. Thompson
Area Engineer

cc: PAU File-Rupture Analyst (?)
Area File ~~xxxxxx~~

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HW

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Failure No. 1808
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT
Submit report for each rupture and stuck charge.

- *1. Area
*2. Tube Number 4365
*3. Date Failed 5-5-68
*4. Date Charged 1-8-68
*5. Lot Number X10054-72A #12
*6. Type Failure
*7. Type Metal (Check one)
<u>I&E Natural</u>	<u>I&E Enriched</u>
Nonbumper ☐	Nonbumper ☐
Bumper ☐	Bumper ☐
Self-support ☐	Self-support ☒
Other <u>PT 067</u>	<u>125E</u>
8. Charge Make Up 412.032 of 125E - qc 12 failed
(Pieces of each type metal, from front end)
9. Production Test No. PT-067 Stuck ☐
Not Stuck ☒

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 11.1
*12. Tube ΔT 107.7
*13. Tube Flow 61.1
*14. Tube Orifice Zone 01

15. Did rupture cause a tube leak No
16. Did tube contain a poison spline No
17. Mixer Location None
18. Date Tube Installed
19. CWT
20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Gamma Monitor went full scale - Pres. Differential
Recorder went full scale - Panellit gauge increased
& scanned reactor
21. Time from first rupture indication to shutdown (minutes) - 12 min
22. Rear pigtail reading (units) 30 R. at mil

*Telephone this information as it becomes available.

(Over)

A-5300-021 (2-64)

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐
25. If quickie failed, why
- a. Cap stuck ☐
- b. Charge stuck ☐
- c. Equipment failure ☐
- Explain _____
- d. Insufficient reactivity ☐
- e. Other (explain) ☐
- Explain _____
26. If not quickied,
- a. Discharged with charge machine ☒
- b. Discharged with other equipment (explain) ☐
- Explain _____
- c. Force required for removal, if stuck _____
27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture _____
28. Remarks Pc # 11 + 14 at the pos located at had
bee hives in the core hole - Reactor screw occurred after
the reactor had been started down
29. Sketch (indicate data end)

Inspected by: [Signature]

Approved: [Signature]
Area Engineer

cc: PAU File-Rupture Analyst (2)
Area File

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HW

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Failure No. 1807
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

- *1. Area KW
*2. Tube Number 4276
*3. Date Failed 4-8-68
*4. Date Charged 10-23-67
*5. Lot Number 31 W pr 23
*6. Type Failure CM
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only
(No Rupture) ☐
Bubbler ☒

I&E Natural

I&E Enriched

Nonbumper ☐
Bumper ☐
Self-support ☐
Other ☐

Nonbumper ☐
Bumper ☐
Self-support ☒

8. Charge Make Up 51 pc K5E 1-1600 SA 3 pc from downstream end
(Pieces of each type metal, from front end)

9. Production Test No. PTA 105 Stuck ☐
Not Stuck ☒

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 7.0
*12. Tube ΔT 10.9
*13. Tube Flow 62.1 gpm
*14. Tube Orifice Zone 01

15. Did rupture cause a tube leak NO 18. Date Tube
16. Did tube contain a poison spline NO Installed
17. Mixer Location NONE 19. CWT

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Panellit gauge went full scale - Gamma Monitor full scale
14 cader 42 was reading 3.5 R at the cooling coil, 1 R
at turret 300 @ riser coil

21. Time from first rupture indication to shutdown (minutes) -20
22. Rear pigtail reading (units)

*Telephone this information as it becomes available.

(Over)

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐

25. If quickie failed, why

- a. Cap stuck ☐
- b. Charge stuck ☐
- c. Equipment failure ☐
- Explain _____

- d. Insufficient reactivity ☐
- e. Other (explain) ☐
- _____
- _____

26. If not quickied,

- a. Discharged with charge machine ☒
- b. Discharged with other equipment (explain) ☐
- _____

c. Force required for removal, if stuck _____

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture NONE

28. Remarks _____

29. Sketch (indicate data end)

Inspected by: P. J. Barrett

Approved: [Signature]
Area Engineer

cc: PAU File-Rupture Analyst (?)
Area File

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Failure No. 1806
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT
Submit report for each rupture and stuck charge.

- *1. Area KE
*2. Tube Number 2884
*3. Date Failed 4/2/68
*4. Date Charged 2/14/67
*5. Lot Number DP035D
*6. Type Failure COEF SPLIT
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only ☐
(No Rupture)
Bubbler ☐

I&E Natural

I&E Enriched

Nonbumper ☐
Bumper ☐
Self-support ☐
Other Depleted

Nonbumper ☐
Bumper ☐
Self-support ☐
Self-support ☒

8. Charge Make Up 2884
(Pieces of each type metal, from front end)

9. Production Test No. 049
Stuck ☐
Not Stuck ☒

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 6.9
*12. Tube ΔT 54.1
*13. Tube Flow 24.0
*14. Tube Orifice Zone 01 UELM

15. Did rupture cause a tube leak NO
16. Did tube contain a poison spline NO
17. Mixer Location NONE

18. Date Tube Installed
19. CWT

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
fine scale gamma monitor

27 psi increase in Panellit in 1 hour

21. Time from first rupture indication to shutdown (minutes) 10 min 20 sec
22. Rear pigtail reading (units) (1500 m at the rail)

*Telephone this information as it becomes available.

(Over)

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HW

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐
25. If quickie failed, why
a. Cap stuck	☐	d. Insufficient reactivity	☐
b. Charge stuck	☐	e. Other (explain)	☐
c. Equipment failure	☐		
- Explain _____
26. If not quickied,
- a. Discharged with charge machine ☐
- b. Discharged with other equipment (explain) ☐
- c. Force required for removal, if stuck _____

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture _____

28. Remarks _____

29. Sketch (indicate data end)

Fuel Element Position #14

Inspected by: JR BARILETT

Approved: W. Yeon

Area Engineer

cc: PAU File-Rupture Analyst (2)
Area File

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Failure No. 1805
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT
Submit report for each rupture and stuck charge.

- *1. Area 105 KE
*2. Tube Number 4671
*3. Date Failed 3-2-68 (0355)
*4. Date Charged 2-13-67 19-R
*5. Lot Number DP 015 D
*6. Type Failure CORE SPLIT (CP)
*7. Type Metal (Check one)

<u>I&E Natural</u>	<u>I&E Enriched</u>
Nonbumper ☐	Nonbumper ☐
Bumper ☐	Bumper ☐
Self-support ☐	Self-support ☐
Other <u>K5D</u>	<u>DEPLETED</u> (KAH)
8. Charge Make Up 38 K5D
(Pieces of each type metal, from front end)
9. Production Test No. 048
Stuck ☐
Not Stuck ☒

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 5.4
*12. Tube ΔT 78.6
*13. Tube Flow 54.7
*14. Tube Orifice Zone 1
15. Did rupture cause a tube leak NO
16. Did tube contain a poison spline NO
17. Mixer Location NONE
18. Date Tube Installed _____
19. CWT _____
20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
GAMMA MONITOR, INCREASED PANELLIT DIAL (15 PSI)
21. Time from first rupture indication to shutdown (minutes) 45 minutes
22. Rear pigtail reading (units) 160 R/hr.

*Telephone this information as it becomes available.

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23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐
25. If quickie failed, why
- a. Cap stuck ☐
- b. Charge stuck ☐
- c. Equipment failure ☐
- d. Insufficient reactivity ☐
- e. Other (explain) ☐
- Explain _____
26. If not quickied,
- a. Discharged with charge machine ☐
- b. Discharged with other equipment (explain) ☐
- c. Force required for removal, if stuck _____

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture _____

28. Remarks Differential count rate meter showed
indication: Filtered sample 7200 to 1

29. Sketch (indicate data end)

slug light tan in color with silver around splits

Inspected by: RJ BARTLETT

Approved: 20 Meen
Area Engineer

cc: PAU File-Rupture Analyst (?)
Area File

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HW

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Failure No. 1804-
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

*1. Area KW
*2. Tube Number 1873
*3. Date Failed 2-25-68
*4. Date Charged 1-8-68
*5. Lot Number 1/6 2 5
*6. Type Failure SL
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only
(No Rupture) ☐
Bubbler ☒

I&E Natural

I&E Enriched

Nonbumper ☐ Nonbumper ☐
Bumper ☐ Bumper ☐
Self-support ☐ Self-support ☒
Other 1.25 PTG 7

8. Charge Make Up 40 pc KSE arch rail support (1.25) centered chg.
(Pieces of each type metal, from front end)

9. Production Test No. PT 667
Stuck ☐
Not Stuck ☒

(From latest equilibrium or near-equilibrium operating period)

*11. Inlet Temperature 4.8 C
*12. Tube ΔT 115.2
*13. Tube Flow 57.9
*14. Tube Orifice Zone 01

15. Did rupture cause a tube leak No
16. Did tube contain a poison spline No
17. Mixer Location No 1.2
18. Date Tube Installed
19. CWT

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)
Full scale on 18 header, 57 panellit increase
Temp increased .5° while sampling effluent - No indication
on diff. riser counter - Sample read 60 mr

21. Time from first rupture indication to shutdown (minutes) ~ 60 min
22. Rear pigtail reading (units) 100 R

*Telephone this information as it becomes available.

(Over)

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HW

Page 3

23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☐

25. If quickie failed, why

- a. Cap stuck ☐
b. Charge stuck ☐
c. Equipment failure ☐
Explain _____

- d. Insufficient reactivity ☐
e. Other (explain) ☐

26. If not quickied,

- a. Discharged with charge machine ☒
b. Discharged with other equipment (explain) _____

c. Force required for removal, if stuck _____

27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture _____

28. Remarks _____

29. Sketch (indicate data end)

Inspected by: LT Bartlett

Approved: LT Morrison
Area Engineer

cc: PAU File-Rupture Analyst (2)
Area File

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Failure No. 1803
(Fill in at 1704-D)

SLUG RUPTURE OR STUCK CHARGE REPORT

Submit report for each rupture and stuck charge.

- *1. Area 100.8
*2. Tube Number 2365
*3. Date Failed 1-21-68
*4. Date Charged 7-10-67
*5. Lot Number KZ-409-G
*6. Type Failure SU
*7. Type Metal (Check one)

Rupture Confirmed ☒
Stuck Charge Only
(No Rupture) ☐
Bubbler ☐

I&E Natural

I&E Enriched

Nonbumper ☐
Bumper ☒
Self-support ☐
Other ☐

Nonbumper ☐
Bumper ☐
Self-support ☐

8. Charge Make Up 6-03NP-103W2-1303NP-1203NP
(Pieces of each type metal, from front end)

9. Production Test No. Stuck ☐
Not Stuck ☒

10. Slug Position

(From latest equilibrium or near-equilibrium operating period)

- *11. Inlet Temperature 8.3
*12. Tube ΔT 22.3
*13. Tube Flow 46.6
14. Tube Orifice Zone OG

15. Did rupture cause a tube leak NO 18. Date Tube
16. Did tube contain a poison spline NO Installed 5-1962
17. Mixer Location 7th 19. CWT

20. How detected (gamma monitor, filtered sample, Panellit increase, etc.)

gamma monitor and panellit
pressure increase

21. Time from first rupture indication to shutdown (minutes) 9 min
22. Rear pigtail reading (units) 3 R

*Telephone this information as it becomes available.

(Over)

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Page 1

23. Quickie Attempted Yes ☐ No ☒
24. Quickie Successful Yes ☐ No ☒
25. If quickie failed, why
a. Cap stuck	☐	d. Insufficient reactivity	☐
b. Charge stuck	☐	e. Other (explain)	☐
c. Equipment failure	☐		
- Explain _____
26. If not quickied,
- a. Discharged with charge machine ☒
- b. Discharged with other equipment (explain) _____
- c. Force required for removal, if stuck _____
27. Note date and time of any tube temperatures that exceeded or possibly exceeded TAI-3 within ten days prior to the rupture NONE
28. Remarks _____
29. Sketch (indicate data end)

↑
rib Marks
↓

Splits in Jacket
Areas Raised up

Medium ledge and light groove corrosion along ribs.

Inspected by: R. J. Bartlett

Approved: R. D. Williams
Area Engineer

cc: PAU Filo-Rupture Analyst (?),
Area Fil

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END

**DATE
FILMED**

1/12/94