CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9902030331 DOC.DATE: 99/01/25 NOTARIZED: NO DOCKET #
FACIL:50-244 Robert Emmet Ginna Nuclear Plant, Unit 1, Rochester G 05000244
AUTH.NAME AUTHOR AFFILIATION
POLFLEIT,P.S. Rochester Gas & Electric Corp.
RECIP.NAME RECIPIENT AFFILIATION
VISSING,G.S.

Revised 3/2/99 2nd cy rec'd

SUBJECT: Forwards revs to Ginna Station Emergency Plan Implementing Procedures (EPIPs).Previous rev had incorrect effective date.

DISTRIBUTION CODE: A045D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 2+51
TITLE: OR Submittal: Emergency Preparedness Plans, Implement'g Procedures,

NOTES:License Exp date in accordance with 10CFR2,2.109(9/19/72). 05000244

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CATEGORY 1 DOCUMENT

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January 25, 1999

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555
Attn: Mr. Guy S. Vissing (Mail Stop 14D11)
Project Directorate I-1

Subject: Revision to Emergency Plan Implementing Procedures
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Gentlemen:

In accordance with 10 CFR 50.4(b)(5), enclosed are revisions to Ginna Station Emergency Plan Implementing Procedures (EPIPs).

We have determined, per the requirements of 10 CFR 50.54(q), that these procedure changes do not decrease the effectiveness of our Nuclear Emergency Response Plan. The previous revision had an incorrect effective date. Please destroy the previous revision and replace it with the enclosed copy.

Very truly yours,

Peter S. Polfleit
Corporate Nuclear Emergency Planner

1/1

A045

030015

Enclosures

xc: USNRC Region 1 (2 copies of letter and 2 copies of each procedure)
Resident Inspector. Ginna Station (1 copy of letter and 1 copy of each procedure)
RG&E Nuclear Safety and Licensing (1 copy of letter)
Dr. Robert C. Mecredy (2 copies of letter only)

PSP/jem

PROCEDURE	REVISION NUMBER
EPIP 1-5	35
EPIP ~~1-6~~ 2-1.6	9

Superseded Per Rev's To EPIP's Dtd 1/25/99 #9902030331

ROCHESTER GAS & ELECTRIC CORPORATION

GINNA STATION

Controlled Copy Number 23

Procedure Number EPIP 1-5

Revision Number 35

NOTIFICATIONS

Responsible Manager

01/22/98

Effective Date

Category 1.0

This procedure contains 23 pages

EPIP 1-5

NOTIFICATIONS

1.0 PURPOSE

The purpose of this procedure is to specify the means by which notifications are made to station personnel for all emergency action levels, to expedite the notification of selected RG&E personnel to augment the emergency response organization and notify offsite agencies.

2.0 RESPONSIBILITY

2.1 The Shift Supervisor, Emergency Coordinator or EOF/Recovery Manager is responsible for making the decision to notify offsite agencies.

2.2 Ginna Station Control Room personnel are responsible for implementing this procedure.

2.3 Community Alert Network (CAN) is responsible for activating the onsite/offsite responders.

2.4 The Corporate Nuclear Emergency Planner is responsible for maintaining the station call lists up to date on a quarterly basis.

3.0 REFERENCES

3.1 Developmental References

3.1.1 Nuclear Emergency Response Plan

3.2 Implementing References

3.2.1 EPIP 1-0, Ginna Station Event Evaluation and Classification

3.2.2 EPIP 2-1, Protective Action Recommendations (PARs)

3.2.3 O-9.3, NRC Immediate Notification

3.2.4 10 CFR 26, Fitness for Duty Programs

3.2.5 P-9, Radiation Monitoring System

EPIP 1-5

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3.2.3 O-9.3, NRC Immediate Notification

3.2.4 10 CFR 26, Fitness for Duty Programs

3.2.5 P-9, Radiation Monitoring System

3.2.6 EPIP 2-2, Obtaining Meteorological Data and Forecasts and their use in Emergency Dose Assessment

4.0 PRECAUTIONS

4.1 New York State and Wayne and Monroe Counties must be notified of all Emergency Classifications within 15 minutes of a declaration.

4.2 The Licensee should notify the USNRC immediately after notification of the appropriate State and local agencies and not later than one hour after the time the licensee declares one of the Emergency Classes.

4.3 Attachment 5 is a specialized notification list of people and organizations who may not require immediate notification but may need to be contacted during an emergency.

5.0 PREREQUISITES

An Emergency has been declared in accordance with EPIP 1-0, Ginna Station Event Evaluation and Classification or offsite assistance has been requested by RG&E personnel.

6.0 ACTIONS

6.1 Shift Supervisor, Emergency Coordinator, EOF/Recovery Manager

6.1.1 Ensure that notifications of all emergency declarations to New York State and Wayne and Monroe Counties are made within 15 minutes of declaring an emergency, in accordance with Attachment 3.

6.1.2 The licensee should notify the USNRC immediately after notification of the appropriate State or local agencies and not later than one hour after the time the licensee declares one of the Emergency Classes using procedure O-9.3 "NRC Immediate Notification".

6.1.3 Upon notification of an Unusual Event at Ginna Station, direct the control room personnel to implement section 6.2.1 of this procedure. If the event is an Alert or higher, implement section 6.2.2.

6.1.4 If additional assistance is required, refer to the NOG E-Plan phone list (in the RG&E telephone directory) in the Control Room and all Emergency Response Facilities, for phone numbers of station personnel.

6.2 **Control Room Personnel**

6.2.1 Unusual Event - Go to Attachment 1

6.2.2 Alert Classification or Higher - Go to Attachment 2

6.2.3 When offsite assistance has been requested - Go to Attachment 5

7.0 **ATTACHMENTS**

1. Unusual Event Notifications
2. Alert or Higher Notifications
3. Instructions for New York State Radiological Emergency Data Forms

3a. New York State Radiological Emergency Data Form (Part 1)

3b. New York State Radiological Emergency Data Form (Part 2)

3c. Instructions for Event 1 and Event 2 Printouts and Plant Status Report

3d. Event 1 Supplemental Information Form

3e. Plant Status Report (PPCS not available)

4. Specialized Notification Call List
5. Notifications When Offsite Assistance has been requested
6. Management Notification Roster

(This attachment is controlled by Nuclear Emergency Preparedness. It is not included as part of the distributed procedure)

UNUSUAL EVENT NOTIFICATIONS

1. Report information to NEW YORK STATE, WAYNE and MONROE counties within 15 minutes of declaring the emergency via RECS Line using **New York State Radiological Emergency Data Forms (Part 1) Attachment 3a.** Fax the **New York State Radiological Emergency Data Form (Part 1) Attachment 3a** to New York State, Wayne County, Monroe County, TSC, EOF, Survey Center and Joint Emergency News Center.

2. Notify USNRC immediately after the notification of the State and Counties, using procedure O-9.3, NRC Immediate Notification

3. Activate the following positions by stating the following:

   "We have an UNUSUAL EVENT at Ginna Station based on

   _____

   (Initiating Condition)

   Please report to your emergency duty station. The event was declared at _____ hrs. We need to remind you of the Fitness for Duty Requirements. Are you available to report for Duty at this time? If not, we are requesting that you standby so you can be notified for the next call in shift".

   A .Plant Manager: Report to the TSC to support the Control Room with offsite communications.

	Joe Widay	Business	3250	Will Report (YES/NO)
		Home	716-586-2679	
		Pager	716-528-3977	
		Cellular	716-748-4681	
OR				
	Dick Marchionda	Business	3699	Will Report (YES/NO)
		Home	315-926-0324	
		Pager	716-464-4403	
		Cellular	716-748-4682	
OR				
	Jack St. Martin	Business	3641	Will Report (YES/NO)
		Home	716-586-5676	
		Pager	716-464-7045	
OR				
	Tom Alexander	Business	3898	Will Report (YES/NO)
		Home	315-524-8084	
		Pager	716-783-7045	

UNUSUAL EVENT NOTIFICATIONS

B. Technical Assessment Manager: Report to the TSC to support the Control Room with offsite communications.

Jeff Wayland	Business	3317	Will Report (YES/NO)
	Home	315-524-2899	
	Pager	716-464-5445	
OR			
Tom Harding	Business	3384	Will Report (YES/NO)
	Home	716-671-8756	
	Pager	716-464-5485	
OR			
Ron Ploof	Business	3673	Will Report (YES/NO)
	Home	716-381-9379	
	Pager	716-921-1722	
OR			
Brian Flynn	Business	3734	Will Report (YES/NO)
	Home	716-293-1565	
	Pager	716-464-5134	
OR			
Peter Bamford	Business	3832	Will Report (YES/NO)
	Home	716-924-0490	
	Pager	716-528-3166	

C. Operations Assessment Manager: Report to the TSC to support the Control Room with offsite communications.

Terry White	Business	3667	Will Report (YES/NO)
	Home	716-226-9381	
	Pager	716-464-7382	
	Cellular	716-748-4683	
OR			
Pete Sidelinger	Business	3509	Will Report (YES/NO)
	Home	716-671-3198	
	Pager	716-463-9830	
OR			
Mike Ruby	Business	3572	Will Report (YES/NO)
	Home	716-872-6559	
	Pager	716-783-6435	

UNUSUAL EVENT NOTIFICATIONS

D. USNRC Resident Inspector: Informational call only

Pete Drysdale	Business	3265
	Home	716-385-6210
		518-877-6103
	Pager	1-800-994-2337 (then dial personal ID# 53133)

OR

Clyde Osterholtz	Business	3265
	Home	716-785-4872
	Pager:	1-800-994-2337 (then dial personal ID# 51578)

E. Corporate Nuclear Emergency Planner: Informational call only

Peter Polfleit	Business	6772
	Home	716-654-5325
	Pager	716-527-2207
	Cellular	716-733-2207

OR

Frank Cordaro	Business	3108
	Home	315-524-2924
	Pager	716-527-3650
	Cellular	716-729-4613

OR

Richard Watts	Business	8706
	Home	716-425-2644
	Pager	716-527-3749
	Cellular	716-747-9760

OR

Frank Orienter	Business	2265
	Home	716-288-8076
	Pager	716-527-5685
	Cellular	716-729-7517

4. If the Unusual Event lasts greater than one (1) hour, report information using the **New York State Radiological Emergency Data Forms (Part 1) Attachment 3a** to New York State, Wayne County, Monroe County, TSC, EOF, Survey Center and Joint Emergency News Center each hour from the time the previous notification was made. Fax the New York State Radiological Emergency Data Form (Part 1) Attachment 3a to New York State, Wayne County, Monroe County, TSC, EOF, Survey Center and Joint Emergency News Center after each report.

ALERT OR HIGHER NOTIFICATIONS

1. Contact Community Alert Network (CAN) at 9-1-800-552-4226. Inform the CAN operator the following information to activate the system:

   a. This is _____. I am the Ginna Control Room Communicator with RG&E.
   (your name)

   b. My password is: Brookwood

   c. My callback number is: _____

   d. This is (circle one): an Actual Event a Drill

   e. This Emergency Classification declared at: _____
   (Time from RECS form)

   f. Message to deliver (circle one):

   Drill Alert Site Area Emergency General Emergency

   g. My current time is:_____. Please start notifications now.

2. Report information to NEW YORK STATE, WAYNE and MONROE counties within 15 minutes of declaring the emergency via RECS Line using **New York State Radiological Emergency Data Forms (Part 1) Attachment 3a.** Fax the **New York State Radiological Emergency Data Forms (Part 1) Attachment 3a** to New York State, Wayne County, Monroe County, TSC, EOF, Survey Center and Joint Emergency News Center.

3. Notify USNRC immediately after the notification of the State and Counties, using procedure O-9.3, NRC Immediate Notification

4. NRC Resident Inspector: Informational call only

Pete Drysdale	Business	3265
	Home	716-385-6210
		518-877-6103
	Pager	1-800-994-2337 (then dial personal ID# 53133)

OR

Clyde Osterholtz	Business	3265
	Home	716-785-4872
	Pager	1-800-994-2337 (then dial personal ID# 51578)

ALERT OR HIGHER NOTIFICATIONS

5. If the Alert of higher lasts greater than 30 minutes report information using the **New York State Radiological Emergency Data Forms (Part 1) Attachment 3a** to New York State, Wayne County, Monroe County every 30 minutes from the time the previous notification was made. Fax the New York State Radiological Emergency Data Form (Part 1) Attachment 3a to New York State, Wayne County, Monroe County, TSC, EOF, Survey Center and Joint Emergency News Center after each report.

6. Notify Energy Operations (8944) that Ginna has an emergency and to implement procedures to increase reliability of power to Ginna.

7. If requested by the TSC or EOF, the Control Room will fax the Event 1 Supplemental Information Form, Attachment 3d to the TSC and EOF.

NOTE: **Event 1 and Event 2 printouts should not be transmitted by the Control Room, but should be faxed by the TSC Administrative/Communications Staff when it is sufficiently manned to do so.**

8. Refer to Attachment 3c for Event 1 and Event 2 instructions.

INSTRUCTIONS FOR NEW YORK STATE RADIOLOGICAL EMERGENCY DATA FORMS

1. The New York State Radiological Emergency Data Form, (Part 1) Attachment 3a should be filled out with the assistance of the Emergency Coordinator or EOF/Recovery Manager and Radiation Protection personnel.

2. For training and drills/exercise, circle "B" - An Exercise. For actual events, circle "A" - NOT An Exercise.

3. The determination for item 6 is made by checking effluent monitor readings against the release rate limits given in procedure P-9.

4. For item 7 of the form, the Emergency Coordinator or EOF/Recovery Manager shall use EPIP 2-1, Protective Action Recommendations.

5. For item 8 of the form, enter the Emergency Action Level (EAL) number from EPIP 1-0, Ginna Station Event Evaluation and Classification.

   NOTE: THE WIND SPEED INDICATOR AT THE 33 FOOT LEVEL IS DESIGNED TO MEASURE ONLY TO 50 MILES PER HOUR.

6. Obtain weather information, items 11-13 of the form, using the plant process computer (PPCS)

   OR

   If the PPCS is not available, use the Control Room weather indication on the RMS rack.

   OR

   The Radiation Protection Shift Technician or Dose Assessment Manager will determine the weather and stability class in accordance with procedure EPIP 2-2.

7. The communicator will initial the "prepared by" line at the bottom of the form. The SS/EC (or designee) will approve the form at the bottom prior to transmission. The communicator will ensure all forms are sent to the Corporate Nuclear Emergency Planner (CNEP) at the conclusion of the event.

8. Report the information on the completed New York State Radiological Emergency Data Form (Part 1) Attachment 3a by reading the statement number and the statement including the designation letter (e.g. "A") to New York State, Wayne and Monroe County within 15 minutes of declaring the Emergency using the RECS Line:

   A. Press button, allow 10 seconds

   B. Request roll call. Ask if the following are on the line:
      1. "New York State"
      2. "Monroe County"
      3. "Wayne County"

   C. "This is Ginna Station"

   D. Report information on New York State Radiological Emergency Data Form (Part 1) Attachment 3a.

INSTRUCTIONS FOR NEW YORK STATE RADIOLOGICAL EMERGENCY DATA FORMS

9. IF RECS LINE IS OUT OF ORDER, perform the following:

Call Wayne County 9-1-315-946-9711 (Wayne County Warning Point)
Inform Wayne County, "This is a Ginna Emergency, please hold while we connect Monroe County and New York State". Press the conference button on the telephone.

Call Monroe County 9-528-2222 (Monroe County Warning Point)
Inform Monroe County, "This is a Ginna Emergency". Press the conference button on the telephone. Wayne and Monroe should now be connected.

Roll call Wayne County_____ Monroe County_____

"Please hold while we connect New York State". Press the conference button on the telephone.

Call New York State 9-1-518-457-2200 (New York State Warning Point)
Inform New York State, "This is a Ginna Emergency". Press conference button on the telephone. Wayne County, Monroe County and New York State should all be connected.

10. Data in items 15 through 20 of the New York State Radiological Emergency Data Form (Part 2) Attachment 3b should be filled out by the TSC/EOF Dose Assessment and transmitted by fax as information becomes available from the TSC/EOF.

11. Fax all New York State Radiological Emergency Data Forms to the following using the instructions on the fax machine:

Wayne County	9-1-315-946-9721
Monroe County	9-256-6355
New York State	9-1-518-457-9942
TSC	3927
EOF	9-262-5788
Survey Center	3612
Joint Emergency News Center	6771

12. Blank copies of the New York State Radiological Emergency Data Form (Part 1 and Part 2) are available in the Control Room.

13. When a County or the State request to be notified only if conditions change or when the event is terminated, check with the State/County warning points to see if they agree. If they all agree, note this in section 8 of the next Part 1 Form notification. The facility with command and control will inform the other RG&E response facilities of the status of notifications. Perform a notification when conditions change or the event is terminated.

NOTE: See Attachment 3 for instructions.

Read everything on this page over the RECS phone.

NEW YORK STATE RADIOLOGICAL EMERGENCY DATA FORM (PART I)

Roll Call Response: New York State Warning Point ☐ Monroe County ☐ Wayne County ☐

1. Message transmitted at:

   Date _____ Time _____ Via: A. RECS B. Other _____

2. This is:

   A. NOT an exercise B. An exercise

3. Facility providing information:

   C. Ginna

4. Classification:

   A. UNUSUAL EVENT
   B. ALERT
   C. SITE AREA EMERGENCY
   D. GENERAL EMERGENCY
   E. EMERGENCY TERMINATED
   F. RECOVERY
   G. TRANSPORTATION INCIDENT

5. Classification Time:

   This Emergency Classification declared at: Date _____ Time _____

6. Release of Radioactive Materials: (Refer to P-9)

   A. No Release above Technical Specifications
   B. Release to the Atmosphere above Technical Specifications
   C. Release to a Body of Water above Technical Specifications

7. Protective Action RECOMMENDATIONS: (Refer to EPIP 2-1)

   A. No need for Protective Actions outside the site boundary
   B. Evacuate the following ERPAs

   W1 W2 W3 W4 W5 W6 W7 M1 M2 M3 M4 M5 M6 M7 M8 M9

   C. Shelter all remaining ERPAs

8. Brief Event Description:
   EAL # _____

9. Plant Status:

   A. Stable
   B. Improving
   C. Degrading
   D. Hot Shutdown
   E. Cold Shutdown

10. Reactor Shutdown: (subcritical)

    A. Not Applicable B. Date _____ Time _____

11. Wind Speed:

    A. _____ Miles/hour at elevation _____ feet

12. Wind Direction:

    From: _____ degrees at elevation _____ feet

13. Stability Class:

    Unstable, Neutral, Stable

    DO NOT REPORT
    Stability Class Work Sheet

    Temperature at 250 feet _____ °F
    Temperature at 33 feet _____ °F
    Temperature Difference _____ °F

    -1.74 -0.65
    Unstable | Neutral | Stable
    -3 -2 -1 0 1
    Temperature Difference

14. Reported By:

    Name _____

    Area Code _____ Number _____

Roll Call Response: New York State Warning Point ☐ Monroe County ☐ Wayne County ☐

FOR RG&E USE ONLY:

Time Prepared: _____ Time Approved: _____ Completed form sent
Prepared By: _____ Approved By: _____ to CNEP - 49/2 _____

NEW YORK STATE RADIOLOGICAL EMERGENCY DATA FORM (PART II)

Telefax this data form to: ☐ New York State ☐ Monroe County ☐ Wayne County

15. Message transmitted at:

Date _____ Time _____ Location/Facility Transmitted From: _____

16. General Release Information

A. Release > Tech Specs started: Date _____ Time _____
B. Release > Tech Specs expected to end: Date _____ Time _____ OR ☐ Unknown
C. Release > Tech Specs ended: Date _____ Time _____
D. Reactor Shutdown: N/A OR Date _____ Time _____
E. Wind Speed: _____ miles/hour at elevation _____ feet
F. Wind Direction from: _____ degrees at elevation _____ feet
G. Stability Class: PASQUILL A B C D E F G OR Other _____

17. Atmospheric Release Information

A. Release from: ☐ Ground ☐ Elevated
B. Iodine/Noble Gas Ratio _____
C. Total Release Rate _____ Ci/sec
D. Noble Gas Release Rate _____ Ci/sec
E. Iodine Release Rate _____ Ci/sec
F. Particulate Release Rate _____ Ci/sec

18. Waterborne Release Information

A. Volume of Release _____ gal or liters
B. Total Concentration _____ μCi/ml
C. Radionuclides in Release _____
D. Total Activity Released _____

19. Dose Calculations (based on a release duration of _____ hours)

Calculation is based on (circle one) A. Inplant Measurements B. Field Measurements C. Assumed Source Term

Table below applies to (circle one) A. Atmosphere Release B. Waterborne Release

Distance	Xu/Q	Dose	
		TEDE (rem)	CDE - Child Thyroid (rem)
Site Boundary			
2 Miles			
5 Miles			
10 Miles			
_____ Miles			

20. Field Measurements of Dose Rates or Surface Contamination/Disposition

Miles/Sector OR Miles/Degrees	Location OR Sampling Point	Time of Reading	Dose Rate OR Contamination (Include Units)

FOR RG&E USE ONLY: Time Prepared: _____ By: _____ Time Approved: _____ By: _____

Completed form sent to CNEP - 49/2 _____

INSTRUCTIONS FOR EVENT 1 AND EVENT 2 PRINTOUTS AND PLANT STATUS REPORT

1. Assure the Plant Process Computer System (PPCS) is operational. If PPCS is not operational, go to step 5.

NOTE: **Obtain Event 1 and Event 2 printouts from the computer analyst if that position is staffed, otherwise perform the following step.**

2. Obtain Event 1 and Event 2 printouts by entering:
   GASR <return>
   Computer response - Enter Group Name
   EVENT1 <return>
   Computer response - Select Printer Location
   Press F1 for Control Room, F2 for EOF, F3 for TSC
   GASR <return>
   Computer response - Enter Group Name
   EVENT2 <return>
   Computer Response - Select Printer Location
   Press F1 for Control Room, F2 for EOF, F3 for TSC
   Place printout in the Event 1 & 2 group trend log book

NOTE: **Event 1 and Event 2 group trend (GTLOG) should be printed every 15 minutes.**

3. Initiate Event 1 & 2 group trend log (GT LOG) by entering:
   GTLOG <return>
   Computer response - Enter Name of Group to Log
   EVENT1 <return>
   Computer response - Enter Update Rate (30-1800 seconds)
   60 <return>
   Computer response - Enter Print Interval (1-30 minutes)
   15 <return>
   Computer Response - Select Printer Location (F1-F4)
   Press F1 for F3 for TSC
   Initiate Event 1 and Event 2 Group Trend Log in EOF by repeating step 3 and enter F2 when selecting printer location.
   Place printouts in Emergency Coordinator or EOF/Recovery Manager notebook

4. Verify with the TSC computer analyst that the PPCX (plant computer data) is being transmitted to New York State, Wayne County and Monroe County via computer modem. If the PPCX (plant computer data) to offsite agencies is unavailable, perform step 2 and fax the printout to New York State, Wayne County and Monroe County.

5. If the PPCS is unavailable, the Plant Status Report (Attachment 3e) must be completed by the Control Room and faxed to the TSC for distribution to New York State, Wayne County, Monroe County and EOF.

6. When completing Attachment 3e, if the parameter is measurable (e.g. pressurizer level) use the numerical value. When the parameter is not measurable, the condition of any deviation from normal should be noted (e.g. core circulation - forced or natural).

EVENT 1 SUPPLEMENTAL INFORMATION FORM

61	Aux Feedwater System	_____Inservice	_____Standby	_____OOS
62	Safety Injection System	_____Inservice	_____Standby	_____OOS
63	Diesel Generators	_____Inservice	_____Standby	_____OOS
64	Containment Fan Cooler System	_____Inservice	_____Standby	_____OOS
65	Service Water System	_____Inservice	_____Standby	_____OOS
66	Post Accident Charcoal Filters	_____Inservice	_____Standby	_____OOS
67	Containment Spray Pumps	_____Inservice	_____Standby	_____OOS
68	Component Cooling System	_____Inservice	_____Standby	_____OOS
69	DC System	A_____v	B_____v	
70	NaOH Tank Level	_____%		

Time Completed:_____

Completed By: _____

PLANT STATUS REPORT (PPCS NOT AVAILABLE)

Plant Parameters		Plant Parameters		Radiation Monitoring	
Reactor Shutdown	YES/NO TIME	Auxiliary Feedwater System	_____ Inservice _____ Standby _____ OOS	R-1 Control Room	Mrem/hr
RCS Pressure	PSIG	Safety Injection	_____ Inservice _____ Standby _____ OOS	R-2 Containment	Mrem/hr
PRZR Level	%	Diesel Generators	_____ Inservice _____ Standby _____ OOS	R-9 Letdown	Mrem/hr
Core Circulation	Forced/Natural	Service Water System	_____ Inservice. _____ Standby _____ OOS	R-10 "A" Containment Iodine	CPM
Subcooled	°F	Cnmt Fan Coolers System	_____ Inservice _____ Standby _____ OOS	R-11 Containment Particulate	CPM
"A" S/G Level	%	Post Acc. Charcoal Filter	Damper Open / Damper Closed	R-12 Containment Gas	CPM
"B" S/G Level	%	Cnmt. Spray Cnmt. Spray Pumps	_____ Inservice _____ Standby _____ Inservice _____ Standby _____ OOS	R-10 "B" Plant Vent Iodine	CPM
"A" S/G Pressure	PSIG	Comp. Cooling System	_____ Inservice _____ Standby _____ OOS	R-13 Plant Vent Particulate	CPM
"B" S/G Pressure	PSIG	D.C. System	/ Volts	R-14 Plant Vent Gas	CPM
Safeguard	Train B (16/17) EDG/Turbine/Offsite	NaOH Tank Level	%	R-29 Containment High Range	R/hr
Offsite Power	Available/Unavailable	RWST Level	%	R-30 Containment High Range	R/hr
Cnmt Pressure	PSIG	B.A. Tank Level	%	R-15 Air Ejector Gas	CPM
Sump "A" Level	FT	Wind Speed	MPH	*R-12A SPING Containment Gas	µCi/cc
Sump "B" Level	IN	Wind Direction (From)	Degrees	*R14A SPING Plant Vent Gas	µCi/cc
RCS Temp	°F	Temperature 33 FT	°F	*R-15A SPING Air Ejector Gas	µCi/cc
RVLIS	%	Temperature 250 FT	°F	R-31 Steam Line "A"	Mrem/hr
CET	°F			R-32 Steam Line "B"	Mrem/hr

R/hr = Roentgen/Hour
µCi/cc = Microcuries/Cubic Centimeter
Mrem/hr = Millirem/Hour

*SPING Unit readigs may be deleted if radiation monitors R-12 and R-14 onTime scale.

Date _____
Completed _____
Completed By _____

SPECIALIZED NOTIFICATION LIST

Medical

1.	Ontario Volunteer Emergency Squad		769-911 **(Ginna Control Room Only)** (To request ambulance) 9-1-315-524-5757 (Business number)
2.	Wayne County Emergency Dispatcher		9-1-315-946-5304
3.	Rochester General Hospital, Emergency Department Triage Nurse		9-338-2300
4.	Rochester General Hospital Main Switchboard		9-338-4000
5.	RG&E Medical Services	Office Alternate Office Answering Service	8600 4616 9-226-3800
	Dr. Robert W. George Dr. T. K. Oates Dr. Alexander Kurchin		
6.	Newark-Wayne Community Hospital		9-1-315-332-2267

Police

1.	New York State Police Warning Point	9-1-518-457-2200 9-1-315-457-6811
2.	Canandaigua State Police	9-398-3200
3.	Williamson State Police	9-1-800-962-0810
4.	Wayne County Sheriff	9-1-315-946-9711
5.	Monroe County Sheriff	9-428-5511

Fire

1.	Ontario Volunteer Fire Department	769-911 **(Ginna Control Room Only)** (To report fire) 9-1-315-524-2661 (Business number)

SPECIALIZED NOTIFICATION LIST

Westinghouse Emergency Response Organization

Notify one Westinghouse contact using list in order shown. Provide available facts to individual and provide updates.

1.	Hank Sepp		9-1-412-374-5282
	Director ESBU Emergency Response	Home	9-1-412-856-4036
		Hotline	9-1-412-856-6121
2.	Dan Lipman		9-1-412-374-6920
	ESBU Service Response Manager	Home	9-1-412-744-3244
3.	Rose Cotton		9-1-412-374-6805
	ESBU Emergency News Communications ENC Manager	Home	9-1-412-963-6129
4.	Mike Young		9-1-412-374-5081
	ESBU Emergency Response Technical Support Manager	Home	9-1-412-243-7996
5.	Tom Hart		9-1-412-374-6980
	ESBU Emergency Response Logistic Manager	Home	9-1-412-837-9486
		Hotline	9-1-412-837-1737
		Pager	9-1-412-765-8886

Other

1.	Ontario Town Supervisor, Roy Herrmann	Office	9-1-315-524-7105
		Home	9-1-315-524-8087
2.	Ontario Water Department		9-1-315-524-2941
3.	Plant Protection Department Kodak Park		9-722-2122
4.	Wayne County Emergency Operations Center		9-1-315-946-5663
5.	Director Wayne County Office of Disaster Preparedness - Thelma Wideman	Home	9-1-315-597-6291
6.	Monroe County Office of Emergency Preparedness (Nights, Weekends, Holidays)	Daytime	9-473-0710
		Offhours	9-528-2222

SPECIALIZED NOTIFICATION LIST (Cont'd.)

7.	Administrator, Monroe County Office of Emergency Preparedness - Mary Louise Meisenzahl	Home Pager	9-624-3194 9-428-5141
8.	University of Rochester Advance RAP Team - David Maillie	Home	9-275-3788 9-334-2428
9.	National Weather Service (Buffalo)		9-1-800-462-7751
10.	Radiation Management Consultants	Office Emergency Fax	9-1-215-824-1300 9-1-215-243-2990 9-1-215-824-1371
11.	Helgeson Nuclear Services Inc		9-1-415-846-3453
12.	James C. Hutton (NSARB)		9-1-716-381-8473
13.	Institute of Nuclear Power Operations		9-1-800-321-0614
14.	American Nuclear Insurers		9-1-203-677-7305
15.	Emergency Preparedness Canada	Phone Fax	9-1-613-991-7000 9-1-613-996-0995
16.	NYPA Environmental Laboratory Fulton, New York	Daytime	9-1-315-593-5740 9-1-315-593-5735
		Lab Manager pager	9-1-800-436-2732 enter pager # 713-6710 then your number
		Mgr Home #	9-1-315-342-0015
		RES on call pager	9-1-800-436-2732 enter pager # 713-6726 then your number

SPECIALIZED NOTIFICATION LIST (Cont'd.)

Company Personnel

1.	Thomson, Bill Manager, Radiation Protection and Chemistry	Business Home Pager	3219 315-342-5082 716-528-8561
2.	Richards, Thomas Chief Executive Officer	Business Home	8299 (716) 288-9186
3.	Lappan, George Manager of Corporate Communications	Business Home	8812 716-377-2490
4.	Mecredy, Robert Vice President Nuclear Operations	Business Home Pager	3494 716-381-6430 716-783-4900
5.	Wilkens, Paul Sr. Vice President Generation	Business Home Pager:	8076 716-248-2385 716-529-6426
6.	Watts, Richard Manager, Nuclear Training	Business Home Pager Cellular	8706 716-425-2644 716-527-3749 716-747-9760

Nuclear Regulatory Commission

1.	Nuclear Regulatory Commission Region 1 - King of Prussia, PA	610-337-5000
2.	Radiation Assistance Program Dept of Energy Brookhaven National Lab	516-282-2200
3.	Commercial telephone system to NRC Operations Center (via Bethesda Central Office)	301-951-0550
4.	Commercial telephone system to NRC Communications Center (via Silver Spring Central Office)	301-427-4056
5.	Commercial telephone system to NRC Operator (via Bethesda Central Office)	301-492-8893

SPECIALIZED NOTIFICATION LIST (Cont'd.)

New York State

1.	James Baranski, State Emergency Management Office (SEMO)	518-457-8909
2.	SEMO Lake District	315-331-4880
3.	NYS Department of Health Rochester Office	716-262-2010
4.	New York State Emergency Operations Center (EOC) Albany	518-454-3337
5.	EOC Albany - Dose Assessment	518-454-3321 518-454-2176

Federal Emergency Management Agency (FEMA)

1.	Emergency Information Coordination Center	202-634-7800 202-646-2400

NOTIFICATIONS WHEN OFFSITE ASSISTANCE HAS BEEN REQUESTED

1. When offsite assistance has been requested activate:
   - Security
   - Nuclear Management
   - Emergency Planning

   Examples of initiating events that could require offsite assistance are:
   - Fire
   - Medical Emergency
   - Security Event
   - HAZMAT Incident
   - Natural Events (such as flooding, earthquakes or severe weather)

2. Security

   Contact Security at 3210, so that they can make preparations for the arrival of the emergency vehicles and personnel.

3. Nuclear Management

   Notify the following individuals:

   "This is the Ginna Control Room. We have requested offsite assistance from_____. Can you be the Nuclear Management contact for this event? Your duties are (a) act as the RG&E lead for this event and (b) act as the liaison between the Control Room and the corporation."

   Nuclear Management (One person required to respond)

Joe Widay	Business	3250	Available (YES/NO)
	Home	716-586-2679	
	Pager	716-528-3977	
	Cellular	716-748-4681	
OR			
Dick Marchionda	Business	3699	Available (YES/NO)
	Home	315-926-0324	
	Pager	716-464-4403	
	Cellular	716-748-4682	
OR			
Bob Mecredy	Business	8069	Available (YES/NO)
	Home	716-381-6430	
	Pager	716-783-4900	

The nuclear management representative may call other nuclear managers or members of the Ginna leadership team.

NOTIFICATIONS WHEN OFFSITE ASSISTANCE HAS BEEN REQUESTED

4. Emergency Planning

Notify the following individuals:

"This is the Ginna Control Room. We have requested offsite assistance from_____. Can you be the Emergency Planning contact for this event? Your duties are (a) activate Public Relations and (b) act as the liaison between the Control Room and government agencies.
_____ is acting as the Nuclear Management lead for this event. He can be reached at _____."

Emergency Planning (One person required to respond)

Peter Polfleit	Business	6772
	Home	716-654-5325
	Pager	716-527-2207
	Cellular	716-733-2207

OR

Frank Cordaro	Business	3108
	Home	315-524-2924
	Pager	716-527-3650
	Cellular	716-729-4613

OR

Richard Watts	Business	8706
	Home	716-425-2644
	Pager	716-527-3749
	Cellular	716-747-9760

OR

Frank Orienter	Business	2265
	Home	716-288-8076
	Pager	716-527-5685
	Cellular	716-729-7517

The Emergency Planning representative will call the duty public information officer (PIO) via the ECC at 771-2233, and inform them of the event. The duty PIO will determine if a media announcement is warranted. The Emergency Planning representative will also contact Wayne County, Monroe County and New York State officials to brief them on offsite resources being used

NOTIFICATIONS WHEN OFFSITE ASSISTANCE HAS BEEN REQUESTED

5. Contact the NRC resident inspector

Pete Drysdale	Business	3265
	Home	716-385-6210 518-877-6103
	Pager	1-800-994-2337 (then dial personal ID# 53133)

OR

Clyde Osterholtz	Business	3265
	Home	716-785-4872
	Pager	1-800-994-2337 (then dial personal ID# 51578)

ROCHESTER GAS & ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

PROCEDURE NO. EPIP 2-16 REV. NO. 9

CORE DAMAGE ESTIMATION

Cordaro
RESPONSIBLE MANAGER

01/22/98
EFFECTIVE DATE

CATEGORY 1.0

THIS PROCEDURE CONTAINS 28 PAGES

EPIP 2-16

CORE DAMAGE ESTIMATION

1.0 PURPOSE

To provide an estimate of the degree of core damage based on fission product concentrations and other indications under accident conditions.

2.0 RESPONSIBILITY

2.1 The Radiation Protection & Chemistry Manager is responsible for obtaining post-accident sampling and analysis information.

2.2 The Engineering Support Manager is responsible for implementing this procedure to obtain estimates of core damage.

3.0 REFERENCES

3.1 Developmental References

3.1.1 NUREG-0737, II.B.3

3.1.2 Westinghouse Mitigating Core Damage Training Manual.

3.1.3 Rogovin Report, Part 2, Volume II, pp 524 - 527.

3.1.4 WASH-1400 Appendix VII.

3.1.5 Westinghouse Owner's Group Post Accident Core Damage Assessment Methodology, Rev. 2, November, 1984.

3.1.6 NUREG 1210, NRC Severe Reactor Accident Incident Response Training Manual

3.1.7 Technology for Energy Report No. R-81-012

3.1.8 Westinghouse Owner's Group (WOG) Severe Accident Management Guidelines, June 1994

3.2 Implementing References

3.2.1 CH-EPIP-LIQUID, Alternate Emergency Sampling of Primary Coolant

3.2.2 CH-EPIP-CV-AIR, Containment Atmosphere Sampling and Analysis During Containment Isolation

3.2.3 CH-PASS-ACCIDENT, Post Accident Sampling at the PASS - Accident Conditions

3.2.4 CH-PASS-SAMP-ANAL, Analysis of Samples Taken at the PASS for Isotopic Analysis

3.2.5 P-9, Radiation Monitoring System

3.2.6 S-14.3, Operation of Containment High Range Area Monitors R-29, R-30.

3.2.7 EPIP 1-0, Ginna Station Event Evaluation and Classification

3.2.8 CH-EPIP-CVHZ, Containment Atmosphere Hydrogen Monitoring

4.0 PRECAUTIONS

4.1 Care should be taken to avoid defining too precisely the extent of core damage based upon initial sampling results. Other plant indicators will also be available (such as incore temperature indication, containment hydrogen monitors, etc.) which should also be considered in arriving at a more refined estimate.

4.2 The time of sampling relative to the suspected transient or core degradation sequence must be considered. The effects of isotope decay, sampling equilibrium and progressing core degradation may tend to complicate sample interpretation.

4.3 Reactor power history is to be considered in determining whether certain key radionuclides have reached equilibrium.

4.4 Measured concentration of radioactivity may need to be adjusted to account for system dilution (e.g. accumulators, safety injection water) prior to estimating fuel damage.

4.5 When providing guidance on plant operations, use the setpoints and instructions found in the Emergency Operating Procedures (EOP's) or Severe Accident Management Guidelines (SAMGs) as appropriate.

5.0 PREREQUISITES

5.1 Isotopic analysis of primary liquids.

5.2 Data from plant radiation monitors.

5.3 Plant operational status including pertinent core data.

5.4 Isotopic analysis of containment atmosphere

5.5 Hydrogen analysis of containment atmosphere.

5.6 Data from core exit thermocouples.

6.0 ACTIONS

6.1 Initial Assessment of Core Damage

6.1.1 Core damage will be initially classified into one of the following categories:

- No damage
- Gap activity released
- Fuel activity released

6.1.2 Check the following plant indications to assess initial core damage:

Indicator	No Damage	Gap Activity	Fuel Activity
R-9 (if not isolated)	<2000 mR/hr.	2000 = 1% 5000 = 5%	N/A
R-29/30	<100 R/hr (approx. 10 R/hr for a LOCA)	>100 R/hr	>1000 R/hr
Core Exit Thermocouples	<750 F	750 F - 1650 F	>1650 F
Containment Hydrogen	None detectable	None detectable	>1%

6.1.3 Other indications that core damage may be taking place:

a. Nuclear instrumentation does not follow normal decay curve following reactor trip.

If there is voiding in the core, excore nuclear instrumentation can read high. This is due to a loss of the water shielding and increased amount of gamma and neutron radiation reaching the detectors.

b. Reactor Vessel Level Indicating System (RVLIS)

RVLIS indication can determine if the core has remained covered. The top of the core, using RVLIS indication, is 78%. If the core has remained covered, core damage should be limited to gap released from cladding defects. However, if the core was uncovered, it becomes more probable that extensive cladding oxidation could have occurred lading to cladding and fuel pellet fragmentation. Refer to drawing 03021-687 for help in determining if the core has been uncovered.

c. Core Exit Thermocouples (CETs)

Attachment 1 shows possible core damage states as core temperature increases.

d. Containment Radiation Monitors

Attachment 2 provides a series of curves showing a monitor dose rate versus time after shutdown. The curves have been calculated for various amounts of core damage. These curves are representative of core damage if there has been a loss of coolant accident (LOCA). The curves will not be representative of core damage from increased radiation or normal leakage into containment.

e. Containment Air Activity

Attachments 3, 4, 5 and 6 have containment air activity for various states of core damage. These activities can be used to estimate the activity in samples drawn from the containment atmosphere or to estimate the amount of curies/second that will released from containment using the design leak rate of 2% a day. The calculated activities are for the following states of core damage:

- 100% release of coolant into containment
- 100% release of the gap activity into containment (using Reg. Guide 1.25 methodology)
- 100% release of the gap activity into containment (using Westinghouse WCAP 7828 methodology)
- 1% release of fuel into containment.

6.2 Detailed Assessment of Core Damage

6.2.1 A detailed assessment of core damage will be performed when isotopic data is available from Radiation Protection and Chemistry.

6.2.2 Use isotopic information and the following table to assess core damage:

Category of Damage	Isotopes Released
No Damage	Normal levels of I-131, I-133, Cs-137, Kr-88, and Xe-133
Gap Activity Released	Increased levels of Kr-88, Xe-133 I-131 and I-133
Fuel Overheating	Te-129, Te-132, Sr-90, Ba-140, La-140, La-142 and Pr-144

Fuel Melting	Ru-103, Ru-106, Rh-105, Mo-99, U, Pu

6.2.3 Use isotopic information and the following ratios to assess core damage:

Isotopic Ratios	Calculated Ratio	Gap Activity Ratio	Fuel Pellet Ratio
Kr-87/Xe-133	_____	0.022	0.22
I-132/I-131	_____	0.17	1.5
I-133/I-131	_____	0.71	2.1
I-135/I-131	_____	0.39	1.9

6.3 Calculation of Released Activity

****

CAUTION

REVIEW DATA NEEDED TO PERFORM CORE DAMAGE (CR) (ATTACHMENT 7) PRIOR TO CALCULATION.

****

6.3.1 Record the following plant indications. The values should be recorded as close as possible to the time at which the samples are taken.

Reactor Coolant System:

Pressure	_____ PSIG
Temperature	_____ °F
Reactor Vessel level	_____ %
Pressurizer level	_____ %

Containment Building:

Atmosphere Pressure	_____ PSIG
Atmosphere Temperature	_____ °F
A. Sump level	_____ Feet
B. Sump level	_____ Inches

6.3.2 Obtain and analyze selected samples using approved procedures. Use reactor shutdown as time zero for all decay calculations.

6.3.3 Correct samples for decay. Correct containment atmosphere samples for temperature and pressure using the following:

$$\text{Act. (atm)} = \text{Act. (Sample)} \times \frac{P_2 \times (T_1 + 460)}{P_1 \quad (T_2 + 460)}$$

where:

Act .	=	Decay-corrected sample activity (uCi/cc)
T_1, P_1	=	measured sample temp. (°F) and pressure (psia)
T_2, P_2	=	CV atmos. temp. (°F) and pressure (psia)

6.3.4 Record decay corrected liquid sample data on the Liquid Sample Worksheet (Attachment 7). Record decay corrected, pressure corrected, temperature corrected containment atmosphere samples on the Containment Atmosphere Worksheet (Attachment 8).

6.3.5 Calculate the sum of the total quantity of each fission product available for release from sampled sources.

****

CAUTION

IT IS ASSUMED FOR THIS DISCUSSION THAT THE RCS IS AT NORMAL MASS AND A LOCA HAS NOT OCCURRED. IF A LOCA HAS OCCURRED, THE DETERMINATION OF THE MASS IN THE RCS MUST BE ESTIMATED BY INDICATIONS AVAILABLE TO OPERATIONS. THE MAJOR ACTIVITY WOULD PROBABLY BE IN THE CONTAINMENT SUMP "A".

****

a. Calculate the quantity of activity in the reactor coolant using:

RCS Mass = (6236 ft^3) x (2.83E4) x (Ratio correction factor)

Curies activity = Act_o(uCi/gm) x RCS Mass x 1E-6

where: RCS Mass calculated from data in step 6.3.1 and Ratio Correction Factor from Figure 1 of Attachment 13.

Record total curies in the appropriate column of Summation Record of Release Quantity (Attachment 9).

b. Calculate total quantity of activity in the sump using:

Curies activity = Act_o (uCi/cc) x Sump Volume x 1E-6

where: Sump volume is determined from Figure 2 of Attachment 13. As an approximate temperature for the liquid in the sump, use the air temperature of containment.

Activity in sump is calculated on Attachment 7.

Record total curies in the appropriate column of Summation Record Release Quantity (Attachment 9).

c. Calculate the total quantity of fission products in the containment building atmosphere by completing Attachment 8 using:

Curies activity = Act.(uCi/cc) x 2.75E10 x 1E-6

where: Act. is the pressure and temperature corrected activity from Attachment 8. Containment Volume at STP is 9.7E5 cubic feet or 2.75E10cc.

Record total curies in the appropriate column of Summation Record of Release Quantity (Attachment 9).

d. Sum total activity (D) obtained in items A, B and C on Attachment 9.

6.4 Power Correction Factor (PCF)

****

CAUTION

STEADY STATE POWER IS ASSUMED PRIOR TO SHUTDOWN. STEADY STATE POWER CONDITION IS ASSUMED WHERE THE POWER DOES NOT VARY BY MORE THAN ± 10 % OF RATED POWER LEVEL FROM TIME AVERAGED VALUE.

****

6.4.1 For half-life of nuclides approximately <1 day:

$$PCF = \frac{\text{Average Power Level (Mwt) for prior 4 days}}{\text{Rated Power Level (Mwt)}}$$

6.4.2 For half-life of nuclide approximately >1 day:

$$PCF = \frac{\text{Average Power Level (Mwt) for prior 30 days}}{\text{Rated Power Level (Mwt)}}$$

6.4.3 For half-life Nuclides <1 year:

$$PCF = \frac{\text{Average Power Level (Mwt) for prior year}}{\text{Rated Power Level (Mwt)}}$$

6.4.4 For half-life of nuclides> 1 year:

$$PCF = \frac{\text{Actual operating EFPD of equilibrium cycle}}{\text{Total expected EFPD of equilibrium cycle operation}}$$

****

CAUTION

FOR THE MAJORITY OF THE SELECTED NUCLIDES, THE 30-DAY POWER HISTORY PRIOR TO SHUTDOWN IS SUFFICIENT TO CALCULATE A POWER CORRECTION FACTOR.

****

6.4.5 Determine the Fission Product Core Inventory by correcting the Equilibrium Source Inventory using the power correction factor equation:

****

CAUTION

THE POWER CORRECTION FACTOR EQUATION BELOW APPLIES TO THE CATEGORY OF NUCLIDES WITH HALF-LIVES GREATER THAN ONE DAY.

****

$$\text{Power Correction Factor} = \frac{\Sigma_j P_j (1-e^{-\lambda i} t^{\circ}_j) e^{-\lambda i} t^{\circ}_j}{RP}$$

where:

P_j = average power level (Mwt) during operating period

t_j at power j

RP = rated power level of the core (Mwt)

t_j = operating period in days at power j where power does not vary more than ± 10 percent power of rated power level from time averaged value (Pj)

^{i} = decay constant of nuclide i in inverse days

t_j = time between end of period of operating at power j and time of reactor shutdown in days

6.4.6 Record power correction factor and calculate corrected source inventory on the Corrected Source Inventory (Attachment 10).

6.4.7 Determine the fraction of release by completing the Record of Fractional Release (Attachment 11 for the source of the release (either gap or fuel pellet).

6.5 Containment Hydrogen Concentration

****

CAUTION

THE USE OF THIS SECTION ASSUMES A LOCA RELEASING H_2 INTO CONTAINMENT FORMED BY A ZIRCONIUM-WATER REACTION IN THE CORE. IF VESSEL FAILURE HAS OCCURRED FOLLOWING CORE DAMAGE, ADDITIONAL H_2 MAY BE GENERATED DUE TO CORE CONCRETE INTERACTION. THIS ADDITIONAL H_2 IS NOT ACCOUNTED FOR IN THE CALCULATIONS WITHIN THIS SECTION.

****

****

CAUTION

THE MAXIMUM VALUE THAT % H_2 APPROACHES DUE TO ZIRCONIUM WATER REACTION IS 13.8% @ STP.

****

6.5.1 Obtain a measurement of containment atmosphere hydrogen concentration.

Assuming that all hydrogen formed by a zirconium-water reaction is released to the containment atmosphere, either use Figure 3 of Attachment 13 or calculate the fraction of zirconium-water reaction with the equation:

$$FZWR = \frac{(\%\ H_2)\ (V)\ (\text{correction factor for STP})}{(ZM)\ (H)\ (100-\ \%H_2)}$$

where:

FZWR = Fraction of Zirconium-Water Reaction

V = Containment volume, SCF, approx. 9.7E5 ft^3

ZM = Total zirconium mass, approx. 23,900 lbs.

H = Conversion factor, 7.92 SCF of H_2 per pound of zirconium reacted

the above equation becomes:

$$FZWR = \frac{(\%\ H_2)\ (5.12)\ (\text{Corr Factor for STP})}{(100-\%H_2)}$$

7.0 ATTACHMENTS

1. Possible Core Damage States as Core Temperature Increases
2. R-29 and R-30 Dose Rate Versus Time After Shutdown
3. Containment Activity (uCi/cc) for a 100% Release of the Coolant Activity
4. Containment Activity (uCi/cc) for a 100% Release of the Gap Activity (RG 1.25)
5. Containment Activity (uCi/cc) for a 100% Release of the Gap Activity (WCAP 7828)
6. Containment Activity (uCi/cc) for a 1% Release of the Fuel Inventory
7. Liquid Sample Worksheet
8. Containment Atmosphere Worksheet
9. Summation Record of Release Quantity
10. Corrected Source Inventory

7.0 **ATTACHMENTS** (Cont'd.)

11. Record of Fractional Release

12. Guideline to Obtain Data Needed for Core Damage Assessment Estimation

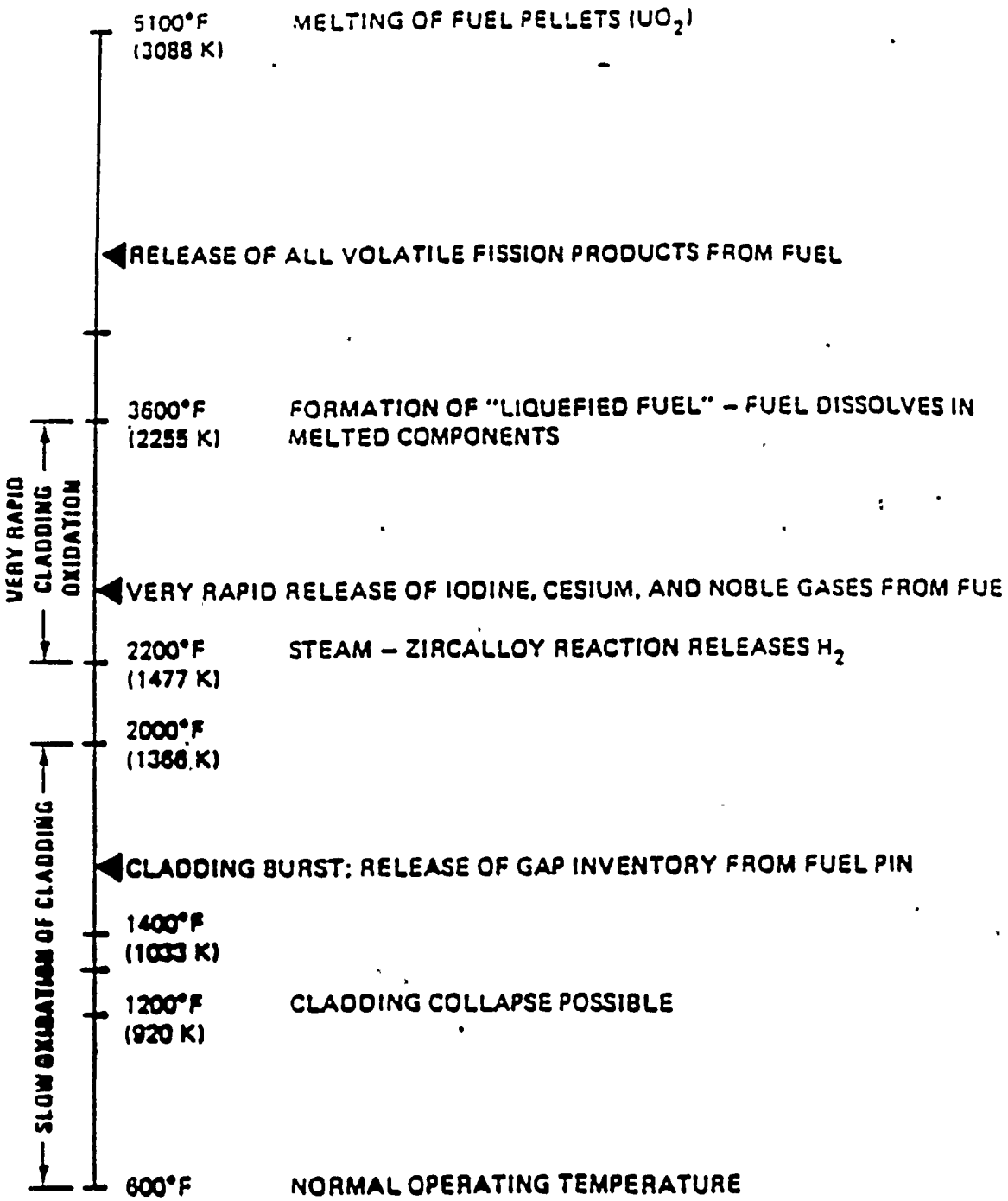
13. Figures

    #1 Ratio of H_20 Density to STP Density as a function of Temperature.

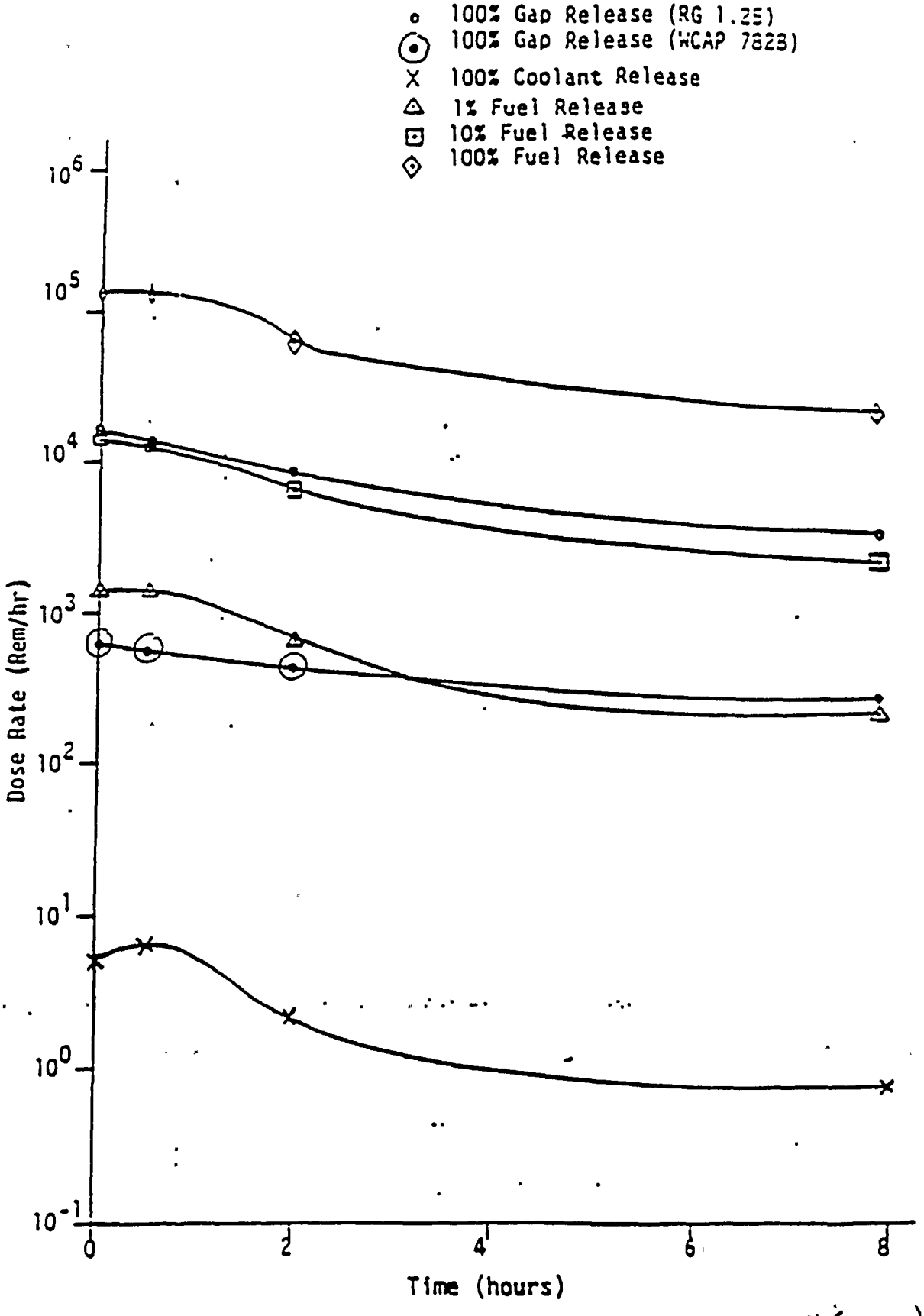
    #2 Gallons in Sump vs Sump Level Indication.

    #3 Containment Hydrogen Concentration vs. Zirconium Water Reaction

POSSIBLE CORE DAMAGE STATES AS CORE TEMPERATURE INCREASES

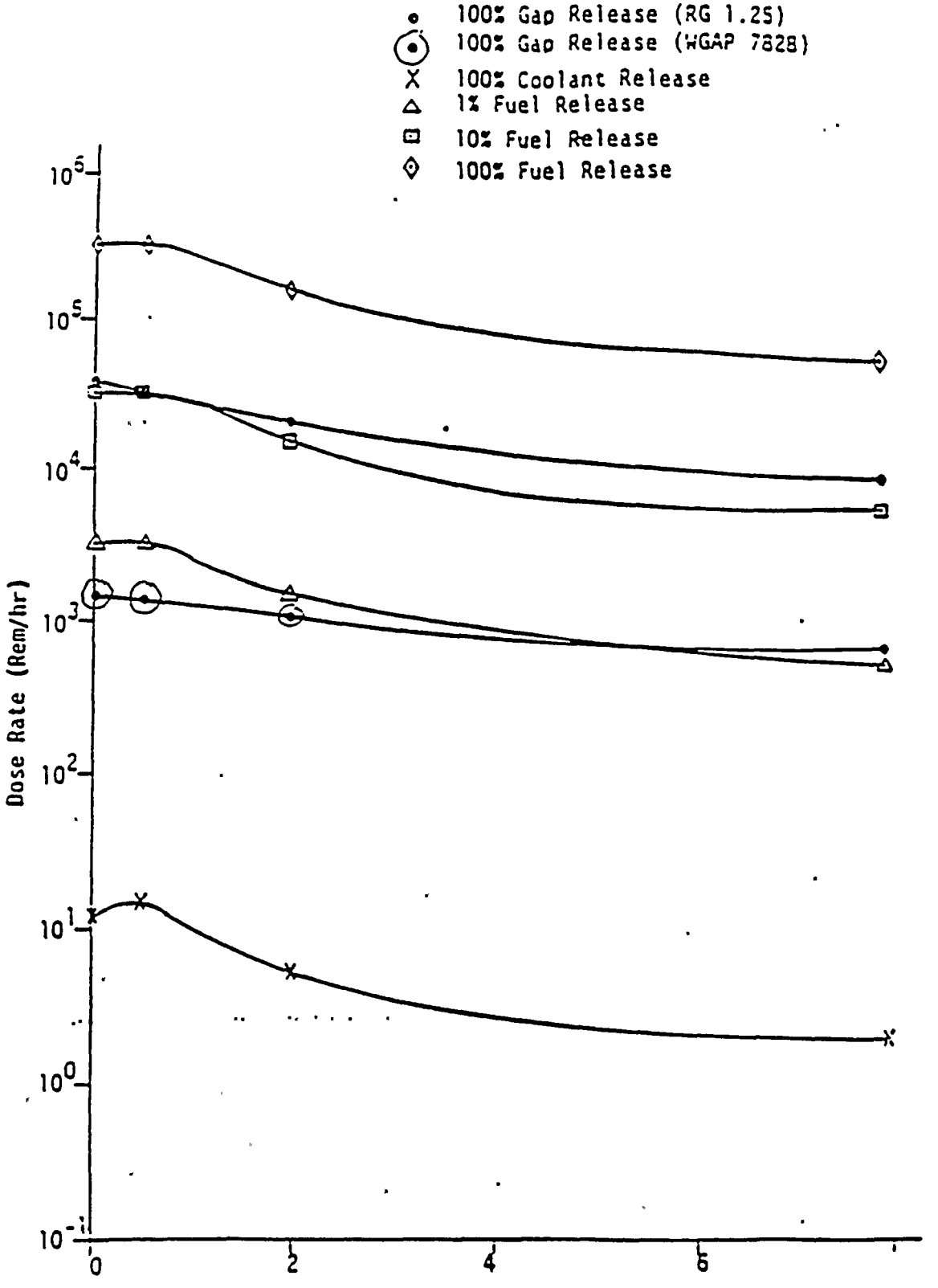


R-29 DOSE RATE VERSUS TIME AFTER SHUTDOWN



Containment High Range Detector 1 Dose Rates. (R-29)

R-30 DOSE RATE VERSUS TIME AFTER SHUTDOWN



Containment High Range Detector 2 Dose Rates. (R-30)

Containment Activity (uCi/cc) for a 100% Release of the Coolant Activity

ISOTOPE	SUBCRITICAL TIME (hours)			
	0.0	0.5	2.0	8.0
Kr-85m	1.31-2*	1.21-2	9.54-3	3.69-3
Kr-85	1.75-2	1.77-2	1.82-2	1.95-2
Kr-87	7.59-3	5.79-3	2.58-3	1.01-4
Kr-88	2.03-2	2.03-2	1.40-2	3.15-3
Xe-131m	0.00+0	6.51-8	2.59-7	1.02-6
Xe-133m	0.00+0	3.14-6	1.21-5	4.23-5
Xe-133	1.54+0	1.54+0	1.52+0	1.48+0
Xe-135m	0.00+0	4.60-5	5.42-5	2.91-5
Xe-135	5.13-2	4.97-2	4.51-2	3.05-2
Xe-138	2.92-1	6.79-2	8.56-4	2.16-11
Br-84	1.22-4	6.38-5	9.13-6	3.83-9
I-131	6.10-3	6.09-3	6.06-3	5.93-3
I-132	2.69-3	2.31-3	1.47-3	2.39-4
I-133	7.90-3	7.77-3	7.39-3	6.04-3
I-134	1.59-3	1.07-3	3.26-4	2.82-6
I-135	6.10-3	5.79-3	4.95-3	2.65-3
Rb-88	0.00+0	1.56-3	1.64-3	3.74-4
Cs-138	0.00+0	1.53-1	3.78-2	1.65-5
TOTAL	1.97+0	1.89+0	1.67+0	1.55+0

*Note 1.31-2 denotes 1.31×10^{-2}

Containment Activity (uCi/cc) for a 100% Release
of the Gap Activity (RG 1.25)

ISOTOPE	SUBCRITICAL TIME (hours)			
	0.0	0.5	2.0	8.0
Kr-85m	3.64+2*	3.36+2	2.65+2	1.03+2
Kr-85	4.26+0	1.01+1	2.50+1	5.92+1
Kr-87	6.92+1	5.28+1	2.35+1	9.20-1
Kr-88	1.06+2	9.36+1	6.45+1	1.45+1
Xe-131m	0.00+0	8.54-4	3.40-3	1.34-2
Xe-133m	7.28+0	7.29+0	7.32+0	7.36+0
Xe-133	2.88+2	2.90+2	2.94+2	3.09+2
Xe-135m	0.00+0	9.88-1	1.16+0	6.26-1
Xe-135	5.46+1	5.81+1	6.88+1	8.30+1
I-131	8.00+1	7.99+1	7.94+1	7.78+1
I-132	1.09+2	9.37+1	5.95+1	9.70+0
I-133	1.46+2	1.44+2	1.37+2	1.12+2
I-134	1.68+2	1.13+2	3.45+1	2.98-1
I-135	1.31+2	1.24+2	1.06+2	5.68+1
Rb-88	0.00+0	7.21+0	7.54+0	1.73+0
TOTAL	1.53+3	1.41+3	1.17+3	8.35+2

*Note 3.64+2 denotes 3.64×10^2

Containment Activity (uCi/cc) for a 100% Release
of the Gap Activity (WCAP 7828)

ISOTOPE	SUBCRITICAL TIME (hours)			
	0.0	0.5	2.0	8.0
Kr-85m	1.06+0*	9.79-1	7.72-1	2.99-1
Kr-85	3.63+0	3.65+0	3.69+0	3.79+0
Kr-87	1.52+0	1.16+0	5.16-1	2.02-2
Kr-88	3.06+0	2.70+0	1.86+0	4.19-1
Xe-131m	0.00+0	2.11-4	8.42-4	3.31-3
Xe-133m	1.00+0	9.99-1	9.94-1	9.69-1
Xe-133	5.81+1	5.81+1	5.83+1	5.85+1
Xe-135m	0.00+0	4.84-2	5.70-2	3.07-2
Xe-135	3.44+0	3.59+0	4.03+0	4.48+0
I-131	1.98+1	1.98+1	1.97+1	1.92+1
I-132	3.17+0	2.73+0	1.73+0	2.82-1
I-133	1.22+1	1.20+1	1.14+1	9.33+0
I-134	3.01+0	2.03+0	6.18-1	5.33-3
I-135	6.42+0	6.09+0	5.21+0	2.78+0
Rb-88	0.00+0	2.08-1	2.18-1	4.98-2
TOTAL	1.16+2	1.14+2	1.09+2	1.00+2

*Note 1.06+0 denotes 1.06 x 10°

Containment Activity (uCi/cc) for a 1% release
of the Fuel Inventory

ISOTOPE	SUBCRITICAL TIME (hours)			
	0.0	0.5	2.0	8.0
Kr-83m	1.20+0*	1.01+0	5.93-1	7.26-2
Kr-85m	3.60+0	3.33+0	2.62+0	1.01+0
Kr-85	1.40-1	1.98-1	3.45-1	6.83-1
Kr-87	7.00+1	5.34+0	2.38+0	9.31-2
Kr-88	1.00+1	8.83+0	6.08+0	1.37+0
Xe-131m	1.20-1	1.20-1	1.20-1	1.18-1
Xe-133m	1.80+1	1.79+1	1.76+1	1.63+1
Xe-133	2.90+1	2.92+1	2.96+1	3.11+1
Xe135m	8.00+0	2.16+0	9.75-2	3.15-2
Xe-135	5.50+0	1.13+1	1.29+1	1.02+1
X3-138	2.90+1	6.75+0	8.50-2	2.14-9
Br-83	3.00-2	2.60-2	1.69-2	3.00-3
Br-84	7.20-2	3.77-2	5.39-3	2.26-6
I-131	3.90+0	3.89+0	3.87+0	3.79+0
I-132	5.60+0	4.81+0	3.06+0	4.98-1
I-133	7.40+0	7.28+0	6.92+0	5.66+0
I-134	8.50+0	5.72+0	1.74+0	1.51-2
I-135	6.60+0	6.26+0	5.36+0	2.86+0
Rb-88	0.00+0	6.80-1	7.12-1	1.63-1
Cs-138	0.00+0	1.52+1	3.76+0	1.64-3
TOTAL	1.44+2	1.30+2	9.78+1	7.40+1

*Note 1.20+0 denotes 1.20 x 10^0

For 10% release multiply values x 10

For 100% release multiply values x 100

LIQUID SAMPLE WORKSHEET

Sample Number:

Sample Location:

Time of Analysis:

Temperature, °F:

Pressure, PSIG:

	*Sample Activity uCi/gm at time of reactor shut-down	Mass of x liquid sampled (gm)	x 1E-6 Ci/uCi	= Corrected total Activity Released (Ci)
Kr 87			1E-6	
Xe 131m			1E-6	
Xe 133			1E-6	
I 131			1E-6	
I 132			1E-6	
I 133			1E-6	
I 135			1E-6	
Cs 134			1E-6	
Rb 88			1E-6	
Te 129			1E-6	
Te 132			1E-6	
Ba 140			1E-6	
La 140			1E-6	
La 142			1E-6	
Pr 144			1E-6	
Cs 137			1E-6	

* Use reactor shutdown as T_o

CONTAINMENT ATMOSPHERE WORKSHEET

Sample Number:

Sample Location:

Time of Analysis:

Temperature, °F:

Pressure, PSIG:

Isotope	Total Activity Act$_o$ Atmosphere, uCi/cc*	x	CV Volume 2.75E10 cc	x	1E-6 Ci/uCi	=	CV Ci
Kr 87			2.75E10		1E-6		
Xe 131m			2.75E10		1E-6		
Xe 133			2.75E10		1E-6		
I 131			2.75E10		1E-6		
I 132			2.75E10		1E-6		
I 133			2.75E10		1E-6		
I 135			2.75E10		1E-6		
Cs 134			2.75E10		1E-6		
Rb 88			2.75E10		1E-6		
Te 129			2.75E10		1E-6		
Te 132			2.75E10		1E-6		
Ba 140			2.75E10		1E-6		
La 140			2.75E10		1E-6		
La 142			2.75E10		1E-6		
Pr 144			2.75E10		1E-6		
Cs 137			2.75E10		1E-6		

$$* \text{Act.(atm)} = \text{Act. (Sample)} \times \frac{P_2 \times (T_1 + 460)}{P_1 \quad (T_2 + 460)}$$

T_1, P_1 = sample temp (°F), sample pressure (psia)

T_2, P_2 = CV temp (°F), CV pressure (psia)

Sample activity has been decay corrected back to time of reactor shutdown.

SUMMATION RECORD OF RELEASE QUANTITY

Isotope	Reactor Coolant Sample Number ___ Act. x RCS Mass Ci	+ Containment Sump Sample Number___ Act. x Sump Mass Ci	+ Containment Atmosphere Sample Number Act. x C.V. Vol. , Ci	= Total Quantity Ci
Kr 87				
Xe 131m				
Xe 133				
I 131				
I 132				
I 133				
I 135				
Cs 134				
Rb 88				
Te 129				
Te 132				
Ba 140				
La 140				
La 142				
Pr 144				
Cs 137				

A + B + C = D

CORRECTED SOURCE INVENTORY

Isotope	Equilibrium Source Inventory Ci	Power Correction Fraction	Corrected Source Inventory Ci
Gap Inventory			
Kr 87	1.6 x 1E3		
Xe 131m	3.8 x 1E2		
Xe 133	7.6 x 1E4		
I 131	1.2 x 1E5		
I 132	2.0 x 1E4		
I 133	8.3 x 1E4		
I 135	4.2 x 1E4		
Fuel Pellet Inventory			
Kr 87	1.7 x 1E7		
Xe 131m	2.7 x 1E5		
Xe 133	8.5 x 1E7		
I 131	4.2 x 1E7		
I 132	6.1 x 1E7		
I 133	8.5 x 1E7		
I 135	7.7 x 1E7		
Cs 134	1.0 x 1E7		
Rb 88	2.5 x 1E7		
Te 129	1.4 x 1E7		
Te 132	6.1 x 1E7		
Sr 89	3.4 x 1E7		
Ba 140	7.3 x 1E7		
La 140	7.7 x 1E7		
La 142	6.5 x 1E7		
Pr 144	5.3 x 1E7		
Cs 137	4.6 x 1E6		

Additional information is available from Westinghouse Core Damage Assessment Methodology tables 2-2; 2-3; 2-3-1.

RECORD OF FRACTIONAL RELEASE

Isotope	From Attachment 9 Total Quantity Available For Release Ci	From Attachment 10 Corrected Source Inventory Ci	(#9/#10) Fraction Released
Gap Inventory			
Kr 87			
Xe 131m			
Xe 133			
I 131			
I 132			
I 133			
I 135			
Fuel Pellet Inventory			
Kr 87			
Xe 131m			
Xe 133			
I 131			
I 132			
I 133			
I 135			
Cs 134			
Rb 88			
Te 129			
Te 132			
Ba 140			
La 140			
La 142			
Pr 144			
Cs 137			

GUIDANCE TO DATA NEEDED FOR CORE DAMAGE ASSESSMENT ESTIMATION

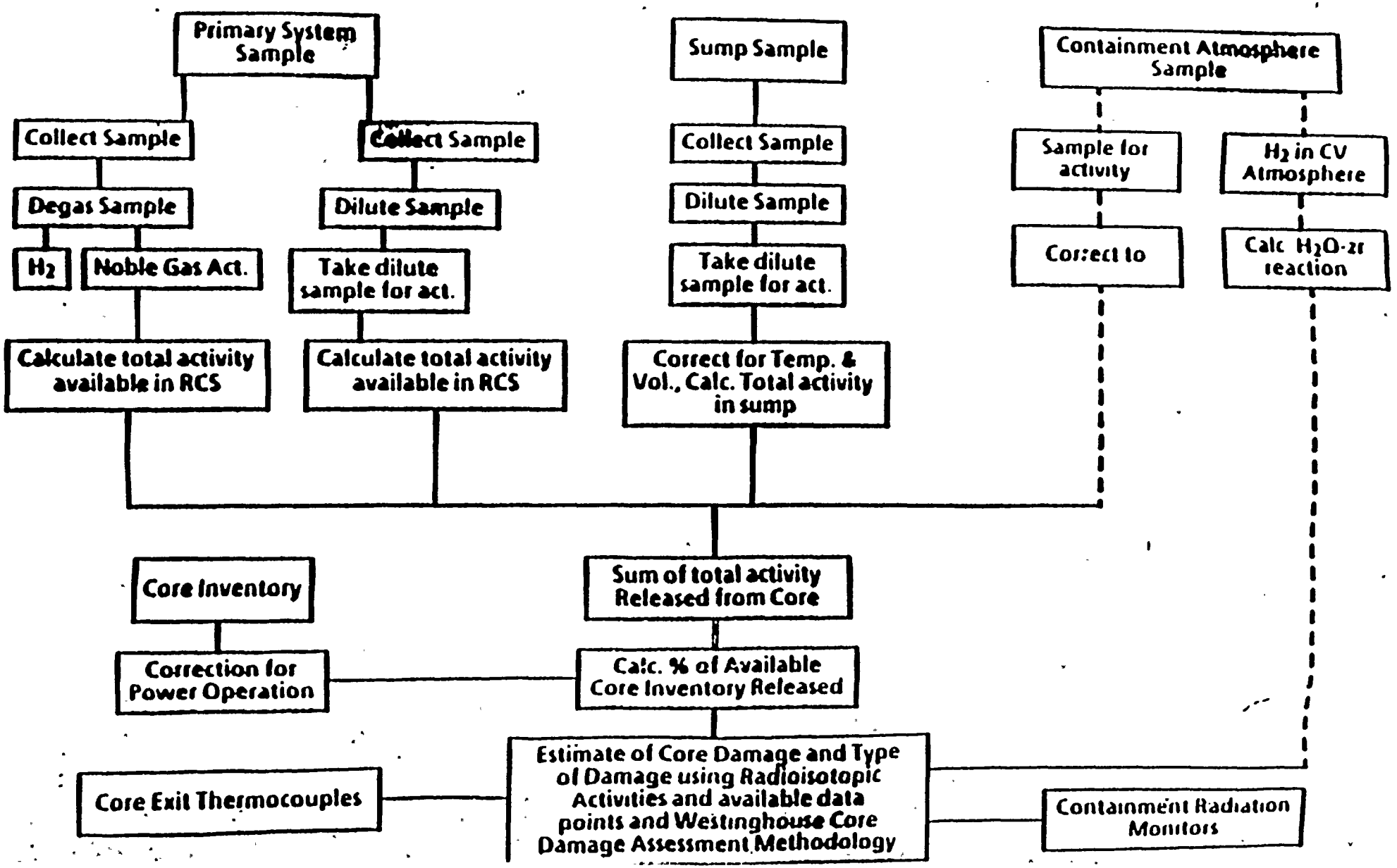


Figure I

Ratio of H_2O Density to STP Density as a function of temperature

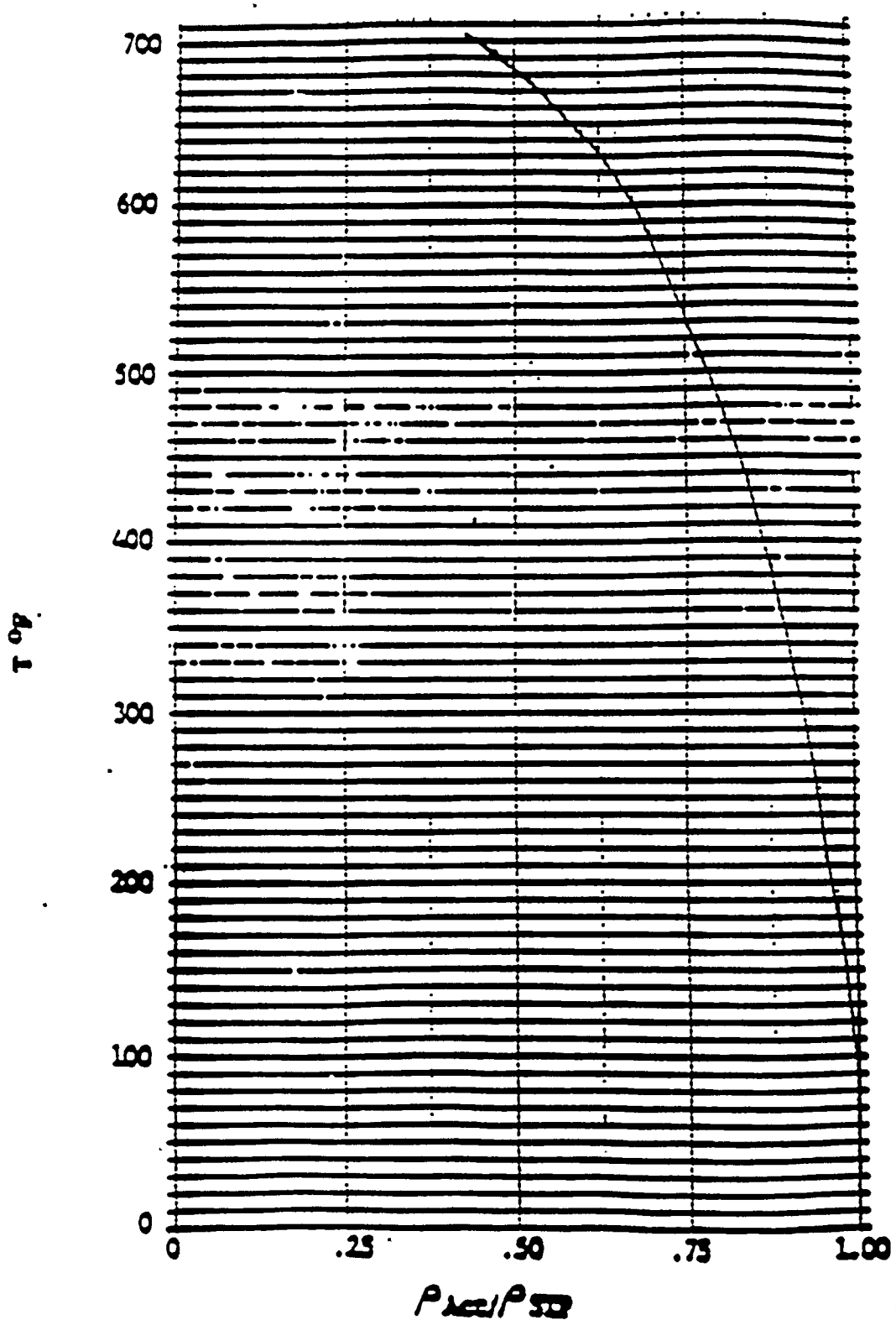


Figure 2 - Gallon in Sump vs Sump Level Indication

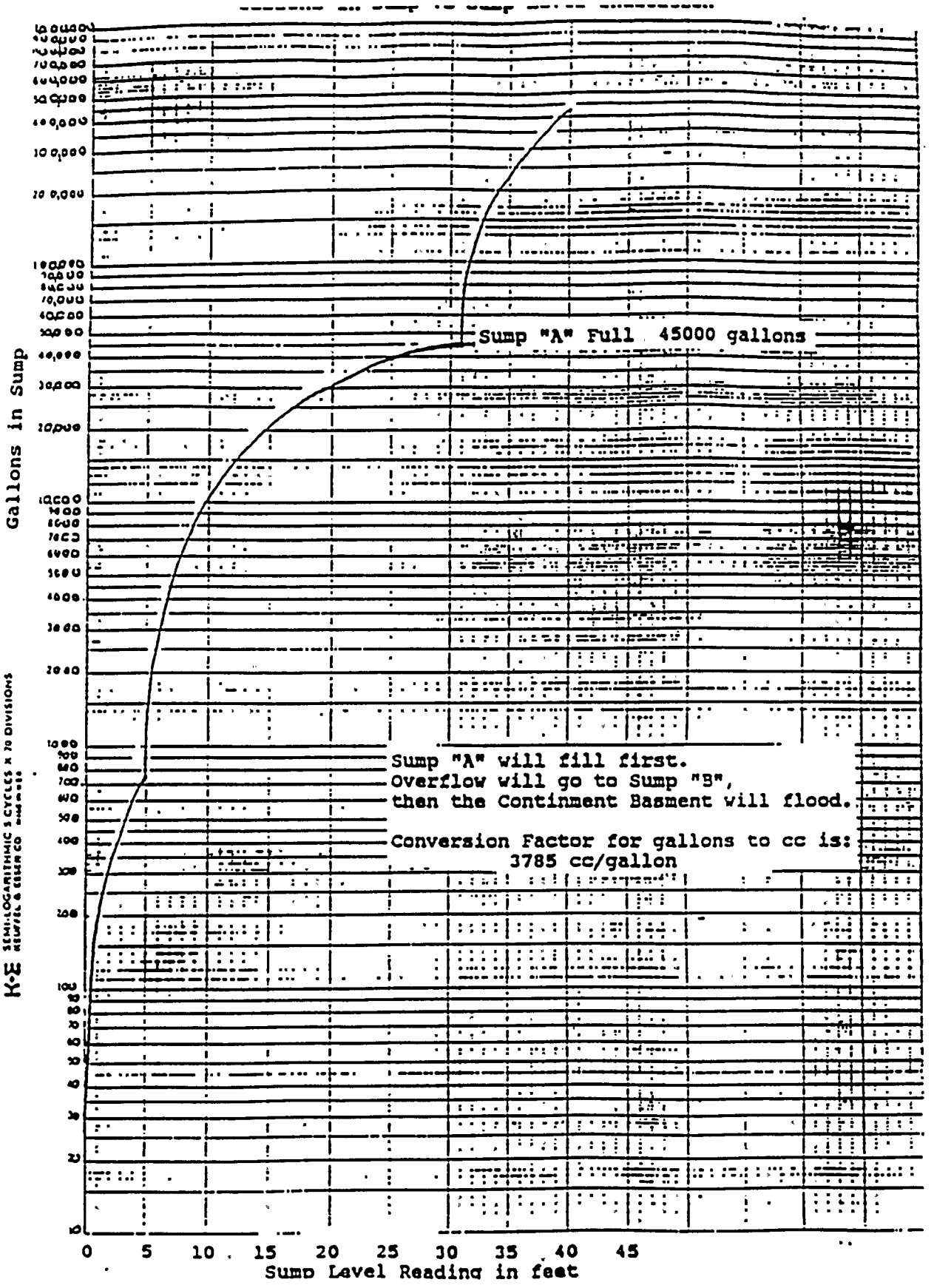
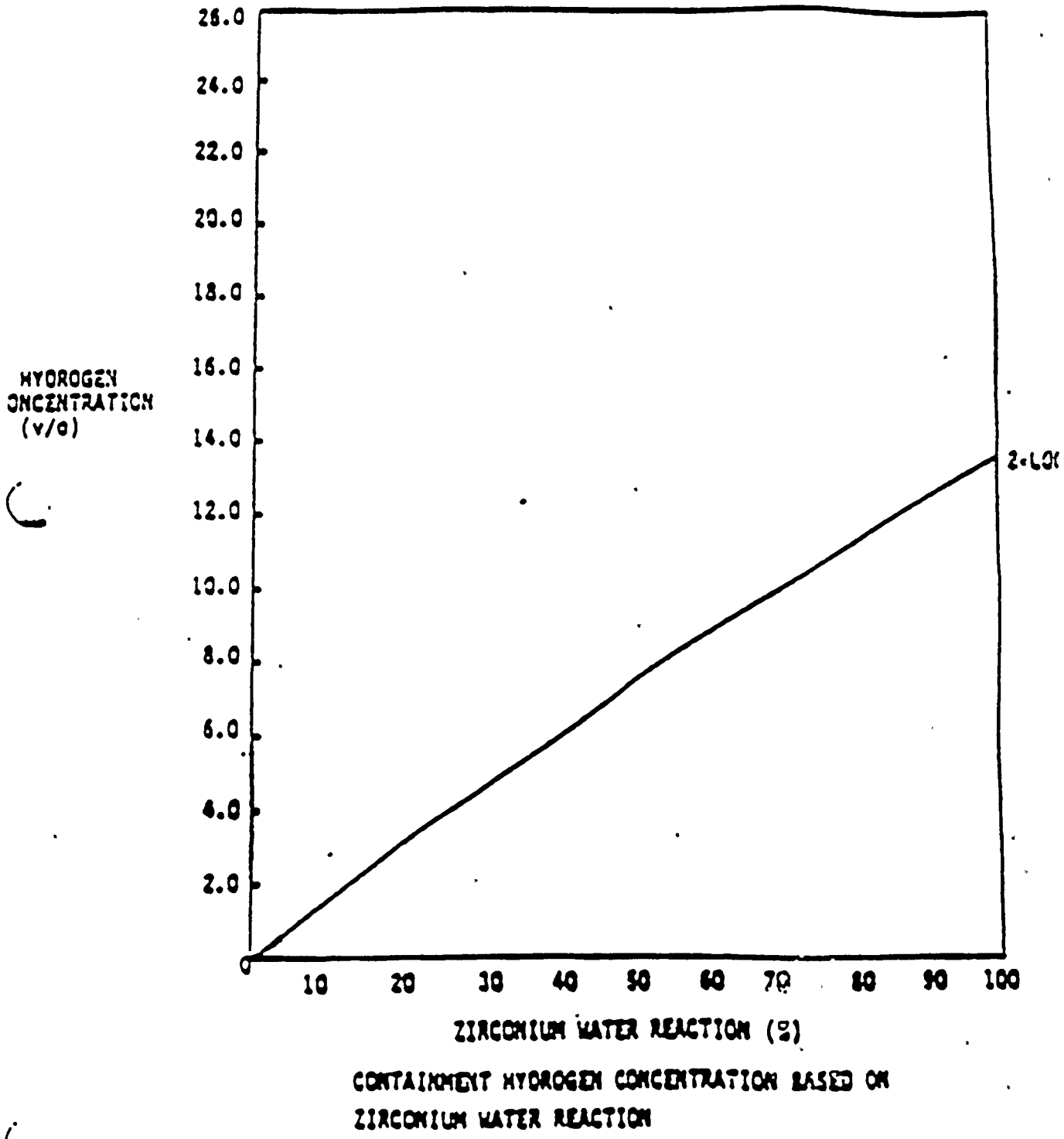


Figure 3
Containment Hydrogen Concentration
vs. Zirconium Water Reaction



CONTAINMENT HYDROGEN CONCENTRATION BASED ON
ZIRCONIUM WATER REACTION