Southern Nuclear Operating Company, Inc. Vogtle Electric Generating Plant Post Office Box 1600 Waynesboro, Georgia 30830 Tel 706.826.4209 Fax 706.826.3321

May 5, 2000

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

NOG-01157

VOGTLE ELECTRIC GENERATING PLANT EMERGENCY PLAN IMPLEMENTING PROCEDURE REVISION

Gentlemen:

In accordance with 10 CFR 50.4, as required by 10 CFR 50, Appendix E, Part V, Southern Nuclear hereby submits the following revision(s) to the Vogtle Emergency Plan Implementing Procedure (s):

<u>Procedure</u>	Revision	Effective Date
91105-C	11	04/18/00
91202-С	11	04/24/00
91502-C	11	04/18/00
91504-C	09	04/18/00

By copy of this letter, the NRC Region II Administrator and the Site NRC Senior Resident Inspector will receive one copy each of the revision(s).

Please contact Angel Cardona at (706) 826-3114 if you have any questions.

Sincerely, (IM

J.T. Gasser General Manager

JTG/AEC/jmm

Enclosure: Emergency Plan Implementing Procedure(s)





U.S. Nuclear Regulatory Commission May 5, 2000 Page 2

xc: <u>Southern Nuclear</u> Mr. J. B. Beasley, Jr. Mr. L. A. Ward NORMS

> <u>Shaw, Pittman, Potts & Trowbridge</u> Mr. E. L. Blake, Jr., Attorney-at-Law (with attachment)

<u>Troutman & Sanders</u> Mr. A. H. Domby, Attorney-at-Law (with attachment)

<u>U. S. Nuclear Regulatory Commission</u> Mr. L. Reyes, Regional Administrator (with attachment - one copy) Mr. J. Zeiler, NRC Senior Resident Inspector, Vogtle(with attachment-one copy) Southern Nuclear Operating Company Nuclear Operations P.O. Box 1600 Waynesboro, Georgia 30830 Telephone 706-724-1562 706-554-9961

RECORDS SUBMITTAL FORM

US NRC ATTN: DOCUMENT CONTROL DESK TO: SET 6 W/ ORIG LTR WASHINGTON, D.C. 20555

Jubmitted to you for storage. Documents indicated by a mark in the SE column.

Submittal No.

Document Number	Rev	SE	Document Description
91105-C	11		"Duties of the EOF Manager"
			3 pages of documentation
91202-C	11		"Activation and Operation of the Operations Support Center"
			3 pages of documentation
91502-C	11		"Core Damage Assessment"
			3 pages of documentation
91504-C	09		"Core Inventory Determinations Using Reactor Power History"
	T		3 pages of documentation
			DECEIVED
			APR 27 2000

Remarks: Printed copies compared to originals in Document Control.

June J. McBride

Submitted By:

Emergency Preparedness Department 04/27/2000 Date

Received By: (Document

Figure 2 (Example)

SOUTHERN A COMPANY Energy to Serve Your World

EP-00-06

Approved By J.T. Gasser	Vogtle Electric Generating Plan	(<u>A</u>	Procedure Number 91105-C	Rev 11
Date Approved 04/18/2000	DUTIES OF THE EOF MAN	AGER	Page Number 1 of 6	6
REFEREN	ICE USE PROCEDURE	PRB REVIEV	W REQUIRED	
1.0	PURPOSE			
	The purpose of this procedure is to provide instruction Facility (EOF) Manager for overall direction of the EOF	ons to the Emerg	gency Operations	
2.0	RESPONSIBILITIES			
2.1	EOF MANAGER RESPONSIBILITIES			
2.1.1	Timely offsite communications when the Emergency Di	rector (ED) is in	the EOF.	
2.1.2	Managing the EOF and directing EOF emergency response	nse personnel.	,	
2.1.3	Coordinating and directing all offsite emergency respon	se functions.		
2.1.4	Providing radiological information to the State and local	l emergency resp	onse agencies.	
2.1.5	Ensuring that ALL Vogtle Electric Generating Plant ((GPC), Southern Nuclear Company (SNC) employees, to the EOF meet the requirements of the Fitness For Da duty personnel.	VEGP), Georgia and vendor/cont uty (FFD) policy	Power Company tractors reporting for recall of off-	
2.1.6	Participation in the development of protective actions re	commendations.		
2.1.7	Providing recommendations on protective actions to the	ED.		
2.1.8	Ordering evacuation of EOF (if needed).			
2.1.9	Review and approve News Releases when Emergency D	pirector is not ava	ilable.	
3.0	PREREQUISITES			
	Site Area Emergency or General Emergency has been activation of the EOF.	declared or the	ED has ordered	
4.0	PRECAUTIONS			
4.1	This procedure shall not take priority over measures replant to a safe operating condition.	quired to mainta	in or restore the	
4.2	This procedure does not replace any plant operating p condition, the EOF Manager will continue to use approp with this and other Emergency Plan Implementing Proce	rocedure. Durin priate plant proce dures.	ng an emergency edures in parallel	

Approved By J.T. Gasser	Vogtle Electric Generating Plant	Procedure Number Ret 91105-C 11
Date Approved 04/18/2000	DUTIES OF THE EOF MANAGER	Page Number 2 of 6
5.0	PROCEDURE	
5.1 [.]	EOF ACTIVATION	
5.1.1	The EOF shall be brought to a standby status at the ALERT classification status is defined as physical readiness of the facility and staffing of key po the ED. The EOF will be operational (capable of being activated) within after initial notification of ERO personnel following the declaration of Emergency or higher declaration.	level. Standby ositions except about an hour f a Site Area
5.1.2	The EOF Manager shall complete the initial actions of the EOF Manage soon as possible and complete the subsequent actions on a continuing basis.	r Checklist as
5.2	STAFF SUPERVISION	
	The EOF Manager shall supervise the activities of the following EOF staff:	
5.2.1	Dose Assessment Manager (dose assessment, protective action recommen Monitoring Team control).	dations, Field
5.2.2	Security Coordinator (site access, accountability, evacuation, liaison w enforcement).	rith local law
5.2.3	Support Coordinator (logistics, offsite support groups, communications, keeping, etc.)	staffing, log

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Approved By J.T. Gasse	er	Vogtle Electric Generating Plant	Procedure Number Rev 91105-C 11
Date Approved 04/18/200	0	DUTIES OF THE EOF MANAGER	Page Number 3 of 6
6.0	REFEREN	CES	
6.1	VEGP EMI	ERGENCY PLAN	
6.2	PROCEDU	RES	
6.2.1	91002-C,	"Emergency Notifications"	
6.2.2	91101-C,	"Emergency Response Organization"	
6.2.3	91203-C,	"Activation And Operation Of The EOF"	
6.2.4	91204-C,	"Emergency Response Communications"	·
6.2.5	91305-C,	"Protective Action Guidelines"	
6.2.6	91501-C,	"Recovery"	
6.3	NUREG-06: Radiological Plants"	54, FEMA-REP-1, Rev. 1 "Criteria for Preparation a Emergency Response Plans and Preparedness in Support	nd Evaluation of of Nuclear Power

END OF PROCEDURE TEXT

Vogtle Electric Generating Plant

DUTIES OF THE EOF MANAGER

Procedure Number Rev 91105-C 11 Page Number 4 of 6

EOF MANAGER CHECKLIST

DESIGNEES

- Manager Outage and Planning
- Manager Training and Emergency Preparedness
- Manager Health Physics/Chemistry
- Manager Plant Modification and Maintenance Support
- Maintenance Manager

RESPONSIBILITY:

Manage the EOF and direct the offsite emergency response. Communicate radiological information to state and local emergency response agencies. Provide support for initial activities associated with planning for re-entry or recovery operations.

INITIAL ACTIONS

- 1. Report to the EOF.
- 2. Sign in on Emergency Response Facility Roster.
- 3. Obtain work packets, appropriate dosimetry as necessary and emergency identification badge.
- 4. Obtain briefing if possible from the ED, TSC Manager or other knowledgeable management personnel.
- 5. Ensure that key EOF positions have been filled by reviewing Emergency Response Facility Roster. Refer to Procedure 91203-C, "Activation And Operation Of The Emergency Operations Facility" for minimum EOF staff requirements.
- 6. Review facility and equipment readiness with EOF staff.
- 7. When adequately staffed, declare the EOF operational, notify the ED, the TSC Manager, Emergency News Center and General Office Operations Center.

NOTE

If a recall of off-duty personnel has been initiated, perform the following:

8. FFD determinations

- a. Review the sign in roster and ensure that ALL personnel reporting to the EOF answer the fitness for duty question.
- b. If any personnel have answered 'yes' to the FFD question, a FFD evaluation is required. The Safety and Health department is available to help make this determination.

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J.T. Gasser		91105-C	11
Date Approved 04/18/2000	DUTIES OF THE EOF MANAGER	Page Number 5 of	6

EOF MANAGER CHECKLIST

Sheet 2 of 3

SUBSEQUENT ACTIONS

- 1.* Maintain log(s).
- 2.* Assist the ED as needed.
- 3.* Provide periodic briefings to EOF staff.
- 4.* Review and approve News Releases when Emergency Director is not available.

Notifications

- 1.* Assist the ED in performing notifications to the State, County, NRC and SRS EOC (Procedure 91002-C, "Emergency Notifications").
- 2. Complete and transmit the Emergency Notification message forms (Procedure 91002-C, "Emergency Notifications") when the EOF is responsible for offsite notifications. Provide to the ED for review and approval.

Protective Actions

- 1.* Coordinate with the Dose Assessment Manager in developing protective action recommendations (Procedure 91305-C, "Protective Action Guidelines").
- 2.* Provide protective action recommendations to the ED.
- 3.* Assure that the EOF remains habitable. Direct activation of the alternate EOF if necessary (Procedure 91203-C, "Activation And Operation Of The EOF").
- 4. If the offsite public alerting sirens are activated by the state or local authorities, then the activation should be repeated by the EOF back-up activation station. Contact Telecommunication or Emergency Preparedness to initiate this activation.

Liaison with Offsite Agencies

- 1.* Assure that the Dose Assessment Manager maintains liaison with the appropriate State radiological officer to transmit radiological information.
- 2.* Provide briefings and liaison with State, County, SRS, FEMA and NRC personnel arriving at the EOF.

* Continuing Activity

Vogtle Electric Generating Plant DUTIES OF THE EOF MANAGER

Procedure Number

91105-C

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11

6 of 6 Sheet 3 of 3

EOF MANAGER CHECKLIST

SUBSEQUENT ACTIONS (CONT'D)

Support Activities

- 1.* Assure that the EOF Support Coordinator is obtaining necessary offsite support when required.
- 2. Coordinate with EOF Support Coordinator to develop extended duty roster, if needed.

<u>Relief</u>

1. Perform relief and complete Relief Checklist in Procedure 91101-C, "Emergency Response Organization".

Emergency Termination

- 1. After the emergency condition has been declared terminated, proceed as follows:
 - a. Hold a final staff meeting.
 - b. Collect logs and checklist from EOF staff.
 - c. Attend a staff briefing with the ED and key staff members to determine recovery actions.

Recovery

1. Coordinate with the ED to provide support for initial recovery planning activities per Procedure 91501-C, "Recovery".

Restoration of the EOF

1. Restore the EOF to a ready condition at the termination of the emergency.

* Continuing Activity

Printed May 3, 2000 at 10:34

Southern Nuclear Operating Company Nuclear Operations P.O. Box 1600 Waynesboro, Georgia 30830 Telephone 706-724-1562 706-554-9961



RECORDS SUBMITTAL FORM

Submittal No. EP-00-06

TO: DOCUMENT CONTROL

The documents described below are being submitted to you for storage. Documents which contain a Safety Evaluation (Part B) are indicated by a mark in the SE column.

Document Number	Rev	SE	Document Description
91105-C	11		"Duties of the EOF Manager"
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91202-C	11		"Activation and Operation of the Operations Support Center"
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Remarks: Printed copies compared to originals in Document Control.

June J. McBride Submitted By:

Received By: (Document

Emergency Preparedness Department

04/27/2000 Date

Figure 2 (Example)

Approved By J. T. Gas	ser	Vogtle Electric Generating Plant 🔺	Procedure Number Re 91202-C 11
Date Approved 04/24/200	d)0	ACTIVATION AND OPERATION OF THE OPERATIONS SUPPORT CENTER	Page Number 1 of 15
REFER	ENCE U	SE PROCEDURE PRB REVIEW	V REQUIRED
1.0	<u>PU</u>	RPOSE	
	The the	purpose of this procedure is to provide instructions for the activation an Operations Support Center (OSC).	nd operation of
2.0	RE	<u>SPONSIBILITIES</u>	
2.1	The arri the	first knowledgeable person from the Emergency Response Organ ving at the OSC shall be responsible for initiating preparations to physicology.	ization (ERO) sically activate
2.2	The coor	OSC Manager shall be responsible for declaring the OSC op rdinating Radiological Emergency Team (RET) formation and dispatch.	perational and
2.3	The Mar Faci	OSC Status Loop Communicator shall be responsible for suppor ager with communications between the OSC and other Emerge lities and RETs.	ting the OSC ncy Response
2.4	I&C Tec	Technicians, Electricians, Mechanics, Chemistry Technicians, H	lealth Physics

- assisting in determining repair/damage control alternatives, corrective actions and serving as members of RETs.
- 2.5 The TSC Manager shall be responsible for ordering evacuation of the OSC based upon recommendations from the OSC Manager and/or the Health Physics Supervisor.

3.0 PREREQUISITES

- 3.1 An Alert, Site Area Emergency or General Emergency has been declared or the Emergency Director (ED) has ordered activation of the OSC.
- **3.2** For a Notification of Unusual Event, the ED may order partial activation of the OSC to provide manpower resources for assignment to RETs.

4.0 PRECAUTIONS

If the radiological conditions indicate that the OSC is uninhabitable, the TSC Manager should consider evacuation of the OSC and to reassemble at the TSC and/or the EOF.

Approved By J. T. Gasser	Vogtle Electric Generation	ng Plant 🛕	Procedure Number Re 91202-C 1
Date Approved 04/24/2000	ACTIVATION AND OPERATION OF THI CENTER	E OPERATIONS SUPPORT	Page Number 2 of 15
5.0	PROCEDURE		
5.1	ACTIVATION		
5.1.1	The ED shall order activation of the OSC, w Maintenance Building, and notifications of Procedure 91002-C, "Emergency Notifications being activated) within about an hour of initial	hich is located on the second propriate OSC staff will. ". The OSC will be operation notification.	and floor of the l be made per onal (capable of
5.1.1.1	To declare the facility activated the following perform the following functions:	g minimum OSC staff mus	st be present to
	POSITION	FUNCTI	<u>ON</u> [,]
	OSC Manager	OSC Management	
	 Health Physics Technicians (2) (May be located at TSC or HPCP) 	Radiation Protection	/First Aid
	• Field Monitoring Personnel (2)	Offsite Surveys	
	• Electricians (2)	Electrical Maintenan	ce
	• Mechanics (2)	Mechanical Mainten	ance
2	• Instrument & Control Technicians (2)	Instrument & Contro	l Maintenance
5.1.2	The following personnel who are members of dosimetry and emergency identification badg Facility Roster", Data Sheet 1, or similar for boards, and follow the directions of the OSC M	the RETs, shall report to the s, sign in on the "Emerg n, set up work stations inclanager:	he OSC, obtain ency Response lusive of status
5.1.2.1	Maintenance Team Leaders/Assistant Team Le	aders not assigned to the TS	SC.
5.1.2.2	I&C Technicians		
5.1.2.3	Mechanics		
5.1.2.4	Electricians		
5.1.2.5	Chemistry and Health Physics Technicians not	assigned to TSC or control	point.
5.1.2.6	Other Operators		
5.1.2.7	OSC Support Staff Personnel		

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5.1.2.7.1	Nuclear Specialist	
5.1.2.7.2	Work Planners	
5.1.2.7.3	Quality Control Specialist	
5.1.2.7.4	Performance Team Technical Staff	
5.1.2.8	OSC Status Loop Communicator(s)	
5.1.3	If other personnel have assumed their assigned position, stand by the shift duty or other assignment in accordance with directions from the C	he OSC for second OSC Manager.
5.1.4	The OSC Manager shall report OSC readiness per the OSC Manager C 91104-C, "Duties Of The OSC Manager".	Checklist, Procedure
5.2	FUNCTIONS AND OPERATIONS	
5.2.1	After activation, the following functions shall be performed at the OS organization shown in Figure 1:	SC according to the
5.2.1.1	Serve as the assembly and staging area for personnel pooled for emerg	ency response.
5.2.1.2	Respond to requests from the ED and TSC concerning deployment of l	RETs.
5.2.1.3	Management of emergency equipment and supplies.	
5.2.1.4	Coordination of movement of personnel in the plant and onsite, excep to the TSC and Control Room.	t for those assigned
5.2.2	The OSC Manager shall coordinate the activities of the Search and Damage Assessment, Damage Control, and Repair and Modification include ensuring that teams are properly briefed and equipped pri- debriefed upon return to the OSC. He shall maintain a communica ensure that important information obtained by these teams is dissemina Control Room, as appropriate.	Rescue, First Aid, Teams. This shall or to dispatch and ations logbook and ated to the TSC and
5.2.3	The OSC Manager shall issue vehicle and fuel pump keys to the offsite	e survey teams.
5.2.4	The OSC Status Loop Communicator(s) shall report directly to the maintain communications logs and status boards.	OSC Manager and
5.2.5	The OSC support staff personnel shall conduct personnel accountab- under the direction of the OSC Manager, per Procedure 91401-0 Accountability".	ility of OSC Staff, C, "Assembly and

Approved By J. T. Gasser		Vogtle Electric Generating Plant	Procedure Number R 91202-C 1
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5.2.6	Tech Man RET radic appro	micians, Off-shift Operators and oncoming shift personnel shall ager and serve as members of emergency teams. Team members shal members. Each team shall include at least one health physic plogical conditions warrant. The composition of teams, reporting re opriate procedures/checklists are as follows:	assist the OSC I be qualified as as technician if equirements and
5.2.6.1	Sear	ch and Rescue Team	
	a.	Designees and Qualifications:	
		At least two members that are familiar with the plant and ONE mu trained, ONE being a Health Physics Technician if radiolog warrant. Team formed by OSC Manager or designee.	ust be First Aid- rical conditions
	b.	Reporting Requirements:	
		Team Leader (designated by OSC Manager) reports to the OSC M or via OSC Foreman/Supervisor at least every one-half hour by h plant telephone, or page.	lanager directly, nand-held radio,
	c.	Procedure/Checklist:	
		Procedure 91306-C, "Contamination Monitoring and Decontamina	tion".
5.2.6.2	First	Aid Team	
	a.	Designees and Qualifications:	
		At least two members, who are First Aid-trained, ONE being a Technician if the injured person is potentially contaminated.	Health Physics
	b.	Reporting Requirements:	
		Team Leader (designated by OSC Manager) reports to the OSC M or via OSC Foreman/Supervisor at least every one-half hour by h plant telephone or page.	fanager directly and-held radio,
	c.	Procedures/Checklists:	
		Procedure 91306-C, "Contamination Monitoring and Decontamina	tion".
		Procedure 91307-C "Contaminated Injury"	

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5.2.6.3	Dan	nage Assessment/Control Team	
	a.	Designees and Qualifications:	
		At least two appropriately qualified OSC personnel. Formed by OS designee.	SC Manager or
	b.	Reporting Requirements:	
		Team Leader (designated by OSC Manager) reports to OSC Mana via OSC Foreman/Supervisor at least every one-half hour by ha plant telephone or page.	ger directly or ind-held radio,
	c.	Procedure/Checklist:	
		Procedure 91306-C, "Contamination Monitoring and Decontaminat Physics Technician accompanies team.	ion", if Health
5.2.6.4	Rep	vair and Modification Team	
	a.	Designees and Qualifications:	
		At least two appropriately qualified OSC personnel. Formed by OS designee.	SC Manager or
	b.	Reporting Requirements:	
		Team Leader (designated by OSC Manager) reports to OSC Mana via OSC Foreman/Supervisor at least every one-half hour by ha plant telephone or page.	ger directly or nd-held radio,
	c.	Procedures/Checklists:	
		Procedures 91306-C, "Contamination Monitoring and Deconta Health Physics Technician accompanies team.	amination", if

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Date Approved 04/24/2000	ACTIVATION AND OPERATION OF THE OPERATIONS SUPPORT CENTER	Γ Page Number 6 of 1	.5
	NOTE		
	In-plant monitoring teams are normally formed at the Health Physics Co	ontrol Point.	
5.2.6.5	In-Plant Monitoring Team		
	a. Designees and Qualifications:		
	At least two members, with at least one being a Health Ph Formed by OSC Manager or designee when dispatched from the	hysics Technician. OSC.	
	b. Reporting Requirements:		
	Team Leader (designated by OSC Manager when dispatcher reports at least every one-half hour to Health Physics Supervi Team Communicator in the TSC by hand-held radio, plant telep	d from the OSC) isor or via Survey hone or page.	
	c. Procedure/Checklist:		
I	Procedure 91302-C, "In-Plant Sampling and Surveys".		
5.2.6.6	Back-Up Fire Brigade		
I	a. Designees and Qualifications:		
	Assigned Fire Brigade personnel. Formed by OSC Manager or o	designee.	
	b. Reporting Requirements:		
	Team Leader (designated by OSC Manager) reports to Fire Bri OSC Manager when assigned task is completed.	igade Captain and	
I	c. Procedure/Checklist:		
	Procedure 92000-C, "Fire Protection Program".		
5.2.6.7	Field Monitoring Team		
	a. Designees and Qualifications:		
	Assigned Field Monitoring Team (FMT) personnel. At least t are Field Monitoring Team trained.	wo members who	

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Approved By J. T. Gasser		Vogtle Electric Generating Plant	Procedure Number Rev 91202-C 11					
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1	b.	Reporting Requirements:						
		Team Leader (designated by OSC Manager or designee) reports at least every one- half hour to the Dose Assessment Manager (or HP Supervisor if the EOF is not activated) via the Field Monitoring Team Communicator in TSC or EOF by mobile and/or hand held radio.						
	c.	Procedures/Checklist						
		Procedure 91303-C, "Field Sampling and Surveys".						
		Procedure 91306-C, "Contamination Monitoring and Decontaminati	ion".					
5.2.6.8	Site	Evacuation Team	·					
	a.	Designees and Qualifications:						
		At least two members with one being a Health Physics Tech or other qualified HP staff member and an assigned Evacuation Team Leader (Nuclear Security Officer). Team formed by the OSC Manager or his designee.						
	b.	Reporting Requirements:						
		Team leader provides periodic progress report to the OSC Manager of via OSC Foreman/Supervisor by radio or telephone.	directly or					
	c.	Procedures/Checklists:						
		Procedure 91306-C, "Contamination Monitoring and Decontaminati	on"					
		Procedure 91403-C, "Site Evacuation", Evacuation Leader Checklist	t					
5.2.7	Prior shift desig	r to activation of the OSC, the ED may dispatch Emergency Teams personnel. In this case, teams will be formed by and report to the gnee.	from assigned he ED, or his					
		NOTES						
		a. Communications links available in the OSC are described on the OSC are described on the Procedure 91204-C, "Emergency Response Communications"	ribed in ".					
1		b. Emergency equipment and supplies stored at or near the detailed in Procedure 91702-C, "Emergency Equipmed Supplies" or 91705-C, "Inventory And Testing Of Em	OSC are ent and nergency					

Approved By J. T. Gasser Date Approved		ACT	Vogtle Electric Generating Plant IVATION AND OPERATION OF THE OPERATIONS SUPPORT	Procedure Number Rev 91202-C 11 Page Number						
04/24/2000		<u> </u>	CENTER	<u>8 of 15</u>						
			Emergency Kits".	Of the						
5.2.8	The OSC Manager will make provisions for a shift change within 12 to 16 hours of the initiation of the current shift.									
5.3	OS	OSC EVACUATION								
5.3.1	Evacuation of the OSC should be considered if the facility is not functional or its radiological conditions reach or exceed either or both of the following values:									
	a.	Dose	Rate = 100 mRem/hr							
	b.	Iodin	1e Activity - 2.7E-7 μCi/cc							
5.3.2	The Maı the	TSC M nager. H TSC and	fanager may order evacuation of the OSC as recommended le shall instruct the OSC Manager to relocate staff, equipment a l/or the EOF, as appropriate.	l by the OSC and supplies to						
5.3.3	The evac the	OSC Ma cuation. TSC.	anager shall determine the reassembly points for the OSC staff Personnel who may be called on for immediate support will t	`and direct the be relocated to						
5.3.4	The OSC Manager shall contact all RETs performing in-plant activities and inform them of OSC evacuation, interim communications methods and reassembly locations.									
5.3.5	The OSC Manager shall keep the TSC Manager apprised of all phases of the evacuation and shall report completion of relocation.									
6.0	<u>RE</u>]	<u>FEREN(</u>	CES							
6.1	VE	GP EME	ERGENCY PLAN							
6.2	PRO	OCEDUI	RES							
6.2.1	910	02-C,	"Emergency Notifications"							
6.2.2	91104-C, "Duties of the OSC Manager"									
6.2.3	91204-C, "Emergency Response Communications"									
6.2.4	913(91302-C "In-Plant Sampling and Surveys"								
6.2.5	9130	03-C,	"Field Sampling And Surveys"							
6.2.6	913(06-C,	"Contamination Monitoring and Decontamination"	÷						

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Approved By J. T. Gasser		Vogtle Electric Generating Plant	Procedure Number Rev 91202-C 11
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6.2.7	91307-C,	"Contaminated Injury"	
6.2.8	91401-C,	"Assembly and Accountability"	
6.2.9	91702-C,	"Emergency Equipment And Supplies"	
6.2.10	91705-C,	"Inventory And Testing Of Emergency Preparedness Mate Which Are Not Part Of The Emergency Kits	rial/Equipment
6.2.11	92000-C,	"Fire Protection Program"	
6.3	NUREG-06 Radiologica Plants"	54, FEMA-REP-1, Rev 1, "Criteria for Preparation and I Emergency Response Plans and Preparedness in Support of	Evaluation of Nuclear Power
6.4	NUREG-06	96, "Functional Criteria for Emergency Response Facilities"	
		END OF PROCEDURE TEXT	

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J. T. G	asser	Vo	ogtle Electric Generating Plant		91202-C 1
Date Appro 04/24/2	oved 000	ACTIVATIO	ON AND OPERATION OF THE OPERATIONS SUP CENTER	PORT	Page Number 11 of 15
		EMER	DATA SHEET 1 GENCY RESPONSE FACILITY ROSTER		Sheet 1 of
Facilit	у				
Date _					
				(FO	D DECALLED
TI	ME	BADGE NO.		PERS Have alcohol	ONNEL ONLY you consumed any in the past 5 hours?
IN	OUT	(NO, SG, SD)	NAME	NO	YES
					· · · · · · · · · · · · · · · · ·
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Approved B J. T. Gasser		Vogtle Electric Gene	rating Plant 🛕		Proc. Number Rev 91202-C 11
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		DATA SHEI	E T 2		
		HABITABILITY	SURVEY		
OSC FACII	LITY			Date	
Time (once per	hour minimum)				
Dose Rate (100 mRem/hr	limit)				
Iodine Activity	(2.7E-7 µCi/cc limit)				
Air Sample Act	tivity				
Swipe Survey					
OSC Manager a advised of the r	and HP Supervisor results				
Performed by ir	nitials				
			••••••••••••••••••••••••••••••••••••••		

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OSC ACTIVATION CHECKLIST

RESPONSIBILITY:

All personnel reporting to the OSC shall prepare the OSC physically for use by the VEGP Emergency Response Organization.

Sheet 1 of 1

INITIAL ACTIONS

- 1. Badge in on the OSC ACAT.
- 2. Review the OSC Floor Plan per layout posted in OSC.
- 3. Sign in on the Emergency Response Facility Roster and answer Fitness for Duty (FFD) question. (FFD question for recalled personnel only).
- 4. Remove emergency response materials and equipment from storage areas and arrange physical facilities per layout posted in OSC.
- 5. Remove telephones, emergency identification badges, status boards, copies of procedures, checklists, maps and other equipment/supplies from the OSC Emergency Kit and prepare the OSC for activation.
- 6. Check operability of telephones by lifting receiver and listening for a dial tone.
- 7. Perform radio check of hand held radios (Channels 1, 2, 3, 4 and 5).

NOTES

OSC personnel that are already in the field performing their emergency duties may be credited as minimum shift staffing for activation. (i.e. HP Technicians/FMT members/crafts).

- 8. Ensure that the minimum OSC staff that is needed for activation is present per section 5.1.1.1 of this procedure.
- 9. Report readiness to the OSC Manager.
- 10. If the OSC Manager has not arrived, begin completing OSC Manager Checklist in Procedure 91104-C, "Duties Of The OSC Manager".
- 11. Establish your workstation and await instructions from the OSC Manager or TSC Manager.

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	LAB FOREMAN CHECKLIST	Sheet 1 of 2						
POSITION	FILLED BY: HP Foreman							
INITIAL A	CTIONS							
1.	Report to the OSC.							
2.	Sign-in on the Emergency Response Facility Roster and badge in on OSC A	ACAT.						
3.	Obtain work packets. (Packets located in the OSC document control cabine	et.)						
4.	Obtain briefings from OSC Manager, senior on-shift Health Physics Technician or HP Supervisor (from TSC) on status of plant and any releases.							
5.	Advise OSC Manager when ready for operation and begin maintaining appropriate logs and checklists.							
6.	Establish an unmanned personnel-monitoring station at the entrance to the OSC.							
7.	Periodically monitor conditions in accordance with the Habitability Checklist on the following sheet.							
<u>SUBSEQUE</u>	INT ACTIONS							

1. Assign Health Physics Technicians to Radiological Emergency Teams (RETs) if radiological conditions warrant or are unknown in areas where teams will be working. (i.e., Plant Entry Security Building, Secondary Alarm Station, Supervisor Nuclear Security office).

NOTE

Do not use a designated emergency response field-monitoring vehicle for transportation to the relocation center.

NOTE

Ensure that the offsite relocation team takes their procedure manual when dispatched from OSC.

Assign Health Physics personnel to report with the Evacuation Leader (Nuclear Security Officer) to the offsite relocation center at an ALERT to set up for decontamination, should a Site Evacuation be ordered.

2.

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LAB FOREMAN CHECKLIST

Sheet 2 of 2

SUBSEQUENT ACTIONS CONTINUED

OFFSITE PERSONNEL MONITORING AND DECONTAMINATION (SITE EVACUATION)

- 1. Upon instruction from the HP Supervisor, dispatch available HP Foreman or Health Physics personnel to the Plant Entry and Security Building Exit to monitor personnel as they evacuate the protected area. Exiting personnel should be frisked for contamination if they alarm the high sensitivity portal monitors.
- 2. If exiting personnel are found to be contaminated, have any contaminated clothing removed and provide temporary coveralls and shoe covers. Direct individuals to the offsite relocation center or other appropriate location for decontamination.
- 3. When required, request permission from the TSC to dispatch additional monitoring teams to the assigned relocation center.
- 4. Remain in contact with the offsite relocation center (via radio channel 5 or telephone) to review the progress of offsite monitoring and decontamination activities.

OSC RADIOLOGICAL HABITABILITY CHECKLIST

- 1. *Periodically monitor radiological conditions in the area.
- 2. *Log the time, dose rate (if appropriate), air sample results, iodine concentration and swipe survey results. (Use Data Sheet 2 or similar form)
- 3. Report findings to the HP Supervisor and OSC Manager.

*Continuing Activity

Southern Nuclear Operating Company Nuclear Operations P.O. Box 1600 Waynesboro, Georgia 30830 706-724-1562 Telephone 706-554-9961



RECORDS SUBMITTAL FORM

Submittal No. EP-00-06

TO: DOCUMENT CONTROL

The documents described below are being submitted to you for storage. Documents which contain a Safety Evaluation (Part B) are indicated by a mark in the SE column.

Document Number	Rev	SE	Document Description		
91105-C	11		"Duties of the EOF Manager"		
			3 pages of documentation		
91202-C	11		"Activation and Operation of the Operations Support Center"		
			3 pages of documentation		
91502-C	11		"Core Damage Assessment"		
			3 pages of documentation		
91504-C	.09		"Core Inventory Determinations Using Reactor Power History"		
			3 pages of documentation		
			DECEIVED		
			APH 27 2000		

Remarks: Printed copies compared to originals in Document Control.

June J. McBride

Submitted By:

Received By: (Document

Emergency Preparedness Department

04/27/2000 Date

Figure 2 (Example)

Vogtle Electric Generating Plant

CORE DAMAGE ASSESSMENT

PRB REVIEW REQUIRED

1.0 <u>PURPOSE</u>

This procedure provides a method to classify and estimate the extent of core damage through core fission product release measurements, reactor vessel level indications, and core exit thermocouple temperatures together with additional auxiliary indicators.

2.0 <u>PRECAUTIONS AND LIMITATIONS</u>

Exercise extreme caution during post-accident sampling and analysis activities. Possible high dose rates at sampling stations and in laboratories require that appropriate radiological precautions be taken to ensure personnel safety.

3.0 <u>PREREQUISITES</u>

An emergency condition has been declared and core damage is suspected.

4.0 <u>RESPONSIBILITIES</u>

4.1 CHEMISTRY DEPARTMENT

4.1.1 Chemistry personnel are responsible for post-accident sampling and analysis activities and transmitting data to the Engineering personnel coordinating core damage assessment activities.

4.2 **OPERATIONS DEPARTMENT**

4.2.1 Operations Department personnel are responsible for collecting, recording and transmitting to the TSC Engineering personnel coordinating damage assessment activities, data provided by Control Room instrumentation through implementation of Procedure 91503-C, "Control Room Instrumentation Output For Assessment Of Core Damage".

4.3 PLANT ENGINEERING DEPARTMENT

4.3.1 Engineering personnel are responsible for overall coordination of this procedure including the assignment of responsibilities to other groups or individuals as is required to complete the assessment.

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			NOTE					
•		Coord inside Indic initia	dinate with the Operations Supervisor on starting of the H_2 e the affected containment building if core damage is s ation of hydrogen concentration is available within 30 m ting flow through the monitors when in standby.	analyzers uspected. inutes of				
4.3.2	Eng Inve	Engineering personnel are responsible for implementing Procedure 91504-C, "Core Inventory Determinations Using Reactor Power History".						
4.3.3	Eng man	Engineering personnel, as coordinators of assessment activities, are responsible for data management.						
4.3.4	Eng (Dai	ineering ta Sheets	personnel are responsible to review the completed core dan $1, 2, 3, 4$, and 5 of this procedure).	nage estimates				
4.3.5	Eng	ineering	personnel are responsible for making all damage estimates.					
5.0	<u>MA</u>	MAIN BODY						
5.1	EVA OF	ALUATI CORE I	ON OF INITIATING EVENT AND PRELIMINARY IN NVENTORY NOTES	DICATIONS				
		a.	No generalized core damage is likely if the fuel assemblies been uncovered. If the RVLIS full range instrument indic the collapsed liquid level has never been below the top of and no core exit thermocouple temperatures correspon superheated steam at the corresponding RCS pressu indicated, then no generalized core damage is probable.	have not eates that the core nding to re were				
		b.	If the core was uncovered, increases in the CVCS letdown containment atmosphere process radiation monitor, Containment Building area radiation monitors are evide some degree of fuel damage occurred.	monitor, and the nce that				
		c.	The automated core damage spreadsheet may be used in lie manual method when performing core damage assessment.	eu of the				
5.1.1	The Dete	TSC Er rminatio	ngineering group should implement Procedure 91504-C, "C ns Using Reactor Power History".	Core Inventory				

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5.1.2	The Pro Dar Loc Inst	e TSC Engineering personnel may request the Operations Department cedure 91503-C, "Control Room Instrumentation Output For Assess mage". The data may be available from the Integrated Plant Compute op and recorded on Data Sheet 1 of procedure 91503-C, "C trumentation Output For Assessment Of Core Damage".	to implement ment Of Core r or the Status Control Room						
5.1.3	Record the length of time the core was uncovered on Data Sheet 1, Sheet 1, line A.1 (Information is obtained from Data Sheet 1 of Procedure 91503-C, "Control Room Instrumentation Output for Assessment of Core Damage").								
5.1.4	When obtained, compare the thermocouple temperatures recorded on Data Sheet 1 of Procedure 91503-C, "Control Room Instrumentation Output For Assessment Of Core Damage" to those in Table 1, "Fuel Damage Versus Core Exit Thermocouple Temperatures".								
5.1.5	Rec cate	cord the maximum thermocouple temperature observed and the correspondence of the temperature observed and the correspondence of temperature observed and temperature o	onding damage						
5.1.6	Obt 915 reco	Obtain the containment high range area monitor reading from Data Sheet 1 of Procedure 91503-C, "Control Room Instrumentation Output For Assessment Of Core Damage" and record on the Y-axis of the graph on Data Sheet 1, Sheet 2.							
5.1.7	Determine the time lapse between core shutdown and the containment area monitor reading and record on the X-axis of the graph on Data Sheet 1, Sheet 2.								
5.1.8	Using the monitor reading from Step 5.1.6 and the time lapse, Step 5.1.7, estimate the core damage based on where the values intersect on the graph on Sheet 2 of Data Sheet 1. Record the damage category on line A.3 of Data Sheet 1, Sheet 1.								
5.1.9	Obtain the Containment Building atmosphere hydrogen concentration from Procedure 91503-C, "Control Room Instrumentation Output For Assessment Of Core Damage".								
5.1.10	Refe Gra	er to percent hydrogen concentration versus percent Zirconium/Water ph on Sheet 2 of Data Sheet 1 to determine the percent of Zircaloy cladd	Reaction Bar ing oxidized.						

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Vogtle Electric Generating Plant

CORE DAMAGE ASSESSMENT

CAUTION

The bar graph indicating the relationship between the containment hydrogen concentration and the percentage of the Zirconium/Water Reaction assumes that all of the hydrogen produced in the reaction is released from the reactor coolant to the containment atmosphere. It does not take into account hydrogen depletion due to the operation of the hydrogen recombiners or hydrogen ignitions. (These factors may be taken into account when attempting to determine the extent of the Zirconium/Water reaction.)

- 5.1.11 Record the result on line A.4 of Data Sheet 1, Sheet 1.
- 5.1.12 If the systems have not been isolated, obtain the CVCS letdown monitor (RE-48000) and containment process radiogas monitor (RE-2562C) data. Record on lines A.5 and A.6 on Data Sheet 1, Sheet 1.
- 5.1.13 Complete Preliminary Core Damage Assessment section of Data Sheet 1, Sheet 1. Immediately transmit a copy of the preliminary core damage assessment results to the Emergency Director or TSC Manager.

5.2 ESTIMATION OF FUEL DAMAGE USING GROSS ANALYSIS DATA

5.2.1 Chemistry personnel obtain post-accident samples of reactor coolant system (reactor coolant or sump) and containment atmosphere.

NOTES

- a. Ensure that sample activities when analyzed are not decay corrected back to the time of sampling as is the routine method of analysis. A decay and ingrowth correction factor will be applied to sample activities later in the procedure which will correct sample activities back to time of reactor shutdown.
- b. Sample volume corrections will be made before the data is entered into this procedure.
- 5.2.2 Chemistry personnel also perform isotopic analysis of post-accident samples. No decay correction should be applied to sample activities.
- 5.2.3 When the Isotopic Analysis Report is received from the Chemistry Department, compare nuclides found in the report to those nuclides representing each category of damage in Table 3, "Selected Nuclides For Core Damage Assessment".

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CORE DAMAGE ASSESSMENT

NOTE

An upper boundary of the extent of fuel damage is made at this point. Use Table 5 if pre-accident RCS activities are not available to check for indicating nuclides. Nuclides are not considered present if specific activities are less than 100 times normal values.

5.2.4 Determine the maximum extent of fuel damage as indicated by the fission products present in samples and record on line B.1 of Data Sheet 1, Sheet 1.

5.3 RADIONUCLIDE SELECTION FOR CORE DAMAGE ASSESSMENT

5.3.1 Select at least two nuclides from each category of damage listed under Table 3, "Selected Nuclides For Core Damage Assessment", for detailed analysis and utilization in final core damage assessment.

NOTE

Not all indicating nuclides identified in both the Isotopic Analysis Report and Table 3 are required for this assessment, however, a better overall assessment is made when several nuclides are used. Ensure that nuclides representing each category of damage exhibited in Table 3 and those indicated in Sub-subsections 5.3.2 and 5.3.3 are included.

- 5.3.2 Include Xenon 133 and at least one other noble gas to allow a noble gas ratio to be determined. (Kr-87 or Xe-131m are the preferred additional nuclide).
- 5.3.3 Include Iodine 131 and at least one other radioiodine to allow a radioiodine ratio to be determined.

NOTES

- a. Consider the length of time that has passed between the reactor shutdown (time of the accident) and the time of sampling and analysis, nuclides with very short half-lives are inappropriate if long periods of time have passed between the reactor shutdown and sample analysis.
- b. Consider the loss of release activity due to a loss of the containment integrity or loss due to condensation prior to the collection of the post accident samples. Reactor coolant and containment atmosphere samples drawn after environmental releases occur will not accurately represent total activities released from the core.

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5.3.4*	Enter into Column 2, of Data Sheet 2, Sheet 2, "Reactor Coolant System Activity", Data Sheet 3, "Containment Atmosphere Activity", and Data Sheet 4, "Additional Activity Released From The Core", the concentration of the nuclides selected above. Data Sheet 4 is provided for use under conditions of loss of activity from containment building.					
	NOTES					
		a. Data Sheet 4, "Additional Activity Released From Core", is p for use in cases where a significant portion of the core product activity is contained in sources other than the reactor and containment atmosphere.	provided fission r coolant			
5.4	DET	FERMINATION OF RELEASE ACTIVITIES	,			
5.4.1*	Determine and record the elapsed time from reactor shutdown to the sample count (Isotopic Analysis) on Data Sheet 2, "Reactor Coolant System Activity", Data Sheet 3, "Containment Atmosphere Activity", and Data Sheet 4, "Additional Activity Released From Core".					
5.4.2*	For 4, "] Shee	For each nuclide selected, determine the ingrowth and decay correction factor using Table 4, "Ingrowth And Decay Correction Factors". Record the factor in Column 3 of Data Sheets 2, 3, and 4.				
5.4.3*	Mul reco	Multiply the measured specific activities by the ingrowth and decay correction factors and record in Column 4 of the respective Data Sheet.				
5.4.4*	Obtain the reactor coolant addition volume and Tavg from Data Sheet 2, "Post Accident RCS Addition Volume Determination", of Procedure 91503-C, "Control Room Instrumentation Output For Assessment Of Core Damage" and record on Data Sheet 2, Sheet 1, "Reactor Coolant System Activity".					
5.4.5*	Convert RCS addition volume, using Data Sheet 2, Sheet 1, from gallons to grams mass as follows:					
	a.	Multiply the total estimated RCS additions volume in line 1 by 3,7 gallon.	'85 grams per			
	b.	Record the grams mass in the appropriate space on line 1.				
* - Denotes r	nanua	I completion of the step is not required if the automated spreadsheet is u	ised.			

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5.4.6	Estimate the RCS mass, using Data Sheet 2, Sheet 1 prior to safety injection as follows:					
	a.	a. Use 2.45E+8 grams if the Reactor Coolant System was from no load temperature and pressure to full load temperature and pressure and proceed to Step 5.4.7 or specific gravity of 0.73 on Core Damage Assessment spreadsheet.				
	b.	mperature and				
		(1)* From the "Specific Gravity Of Water VS Temperature" gra the specific gravity of the coolant at Tavg (at the beginning of and record in the appropriate space on line 2.	oph, determine of the incident)			
		(2) Multiply the reactor coolant cool mass (3.32E+8 grams), b gravity at Tavg and record on line 2.	by the specific			
5.4.7*	Complete the post accident mass calculation, using Data Sheet 2, Sheet 1, as follows:					
	a.	Add the added mass from line A.1, to the initial mass on line A.2.				
	b.	Record the sum on line A.3 of Sheet 1, and in the appropriate spac Data Sheet 2, Sheet 2.	e at the top of			
5.4.8*	Mul and	Multiply the corrected specific activities, (Column 4) of Data Sheet 2, by the RCS mass and record in Column 5.				
5.4.9*	On Data Sheet 3, "Containment Atmosphere Activity", multiply the corrected specific activities (Column 4) by the containment atmosphere volume and record in Column 5.					
5.4.10*	On Data Sheet 4, "Additional Activity Released From Core", if used, multiply the corrected specific activity (Column 4) by the corresponding mass or volume and record in Column 5.					
5.5	TOTAL RELEASED ACTIVITY OF THE SELECTED RADIONUCLIDES					
5.5.1*	Record the activities from Column 5 of Data Sheet 2, Sheet 2, on the appropriate line of Column 2 of Data Sheet 5, "Release Activity And Percent Activity Released".					
5.5.2*	Record the activities from Column 5 of Data Sheet 3 on the appropriate line of Column 3 of Data Sheet 5.					
5.5.3*	Record the activities from Column 5 of Data Sheet 4 if used, on the appropriate line of Column 4 of Data Sheet 5.					
* - Denotes	manua	al completion of the step is not required if the automated spreadsheet is u	ised.			

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5.5.4*	Ad Co	Add Columns 2, 3 and 4 of Data Sheet 5, Sheets 1 and 2, for each nuclide, and record in Column 5.						
5.5.5*	Rec froi Po'	Record in Column 6 of Data Sheet 5, Sheet 1 and 2, the total corrected core inventories from the completed Procedure 91504-C, "Core Inventory Determinations Using Reactor Power History".						
5.5.6*	Det Col	Determine the release percentage by dividing the activity of each nuclide on Data Sheet 5, Column 5, by the total corrected core inventory, Column 6 and multiply by 100.						
5.5.7*	Rec	cord each release percentage in Column 7.						
5.6	ES [*] PE	TIMATION OF PERCENT FUEL DAMAGE FROM RCENTAGES	RELEASE					
5.6.1	Wit Fot	With the release percentages in Column 7, of Data Sheet 5, use Enclosure 1, "Instructions For Utilization Of Percent Clad Damage, Pellet Overtemperature And Fuel Melt".						
5.6.2	Rec exa	Record on line B.2 of Data Sheet 1, Sheet 1, the overall core damage category based on examination of the release percentages recorded on Data Sheet 1, Sheet 3.						
1		NOTE						
		Within the limitations of the accuracy associated with this m assessment, estimates are limited to the following categories:	ethod of					
		No Fuel Damage						
		Less Than 50% Cladding Failure Greater Than 50% Cladding Damage						
		Less Than 50% Fuel Overtemperature						
		Greater Than 50% Fuel Overtemperature Less Than 50% Fuel Melt						
		Greater Than 50% Fuel Melt						
5.6.3	To onl	determine whether iodine spiking has affected the analysis results use ly if fuel overtemperature has not occurred:	the following					
	а.	Compare the concentrations of the nuclides from the isotopic analy Table 5, "Normal Operating Activity" or the last RCS isotopic analy transient. An increase of 100 times or more is considered s degradation.	/sis to those in /sis prior to the ignificant fuel					
* - Denotes 1	manu	al completion of the step is not required if the automated spreadsheet is	used.					

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- b. If the radioiodine activities are disproportionately high in comparison to other fission product activities, consider that the radioiodine activity may be due to the spiking phenomenon and not due to fuel degradation.
- c. Review Table 6, "Iodine 131 Activity Available For Release Due to Spiking Phenomenon", to determine if the iodine activity is elevated due to the spiking phenomena and not fuel degradation.

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5.7 FUEL DAMAGE CLASSIFICATION BY ACTIVITY RATIOS

- 5.7.1* Determine the noble gas ratios by dividing the total corrected release activity of the noble gas nuclides in Column 5 of Data Sheet 5, by the total corrected release activity of Xenon 133. Record the noble gas ratio(s) on Data Sheet 1, Sheet 1, line B.4.
- 5.7.2* Compare the noble gas ratios (from Sub-subsection 5.7.1) to those in Table 7, "Noble Gas and Radioiodine Activity Ratios Of Gap and Fuel Pellet".
- 5.7.3 If the actual noble gas ratio resembles the Gap Activity Ratio, record "Clad Damage" on Data Sheet 1, sheet 1, line B.4. If the actual noble gas ratio resembles the Fuel Pellet Ratio, record "Overtemperature" or "Fuel Melt" on Data Sheet 1, sheet 1, line B.4.
- 5.7.4* Determine the radioiodine activity ratio. Divide the total corrected release activity of the radioiodine isotopes in Column 5, of Data Sheet 5, by the total corrected release activity of Iodine 131. Record the iodine ratio(s) on Data Sheet 1, Sheet 1, line B.3.
 - 5.7.5* Compare the radioiodine activity ratio to that in Table 7.
 - 5.7.6 If the actual radioiodine ratio resembles the Gap Activity Ratio, record "Clad Damage" on Data Sheet 1, sheet 1, line B-3. If the actual radioiodine ratio resembles the Fuel Pellet Ratio, record "Overtemperature" or "Fuel Melt" on Data Sheet 1, sheet 1, line B.3.

5.8 FINAL ASSESSMENT

5.8.1 Perform the final core damage assessment by evaluating the data recorded on Data Sheet 1, "Core Damage Assessment Summary", Sheets 1, 2, and 3. Record the final assessment on the appropriate line on Data Sheet 1, Sheet 1.

* - Denotes manual completion of the step is not required if the automated spreadsheet is used.

Vogtle Electric Generating Plant

CORE DAMAGE ASSESSMENT

NOTE

The final assessment is a broad based examination of all data collected. Because of overlapping values of release activities and potential simultaneous conditions of clad damage, overtemperature, and core melt, Considerable Judgment is required in the final assessment.

5.8.2 On completion of the final assessment, forward the completed Data Sheet 1, Sheets 1, 2 and 3 to the Emergency Director or the TSC Manager.

6.0 <u>ACCEPTANCE CRITERIA</u>

NONE

7.0 <u>REFERENCE</u>

7.1 Westinghouse Owners Group Post-Accident Core Damage Assessment Methodology, Revision 2, November, 1984.

7.2 **PROCEDURES**

- 7.2.1 91504-C, "Core Inventory Determinations Using Reactor Power History"
- 7.2.2 91503-C, "Control Room Instrumentation Output For Assessment Of Core Damage"

END OF PROCEDURE TEXT
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CORE DAMAGE ASSESSMENT

Vogtle Electric Generating Plant

TABLE 1

FUEL DAMAGE VERSUS CORE EXIT THERMOCOUPLE TEMPERATURES

Fuel Damage	Temperature °(F)
No Damage	<750
Clad Damage (0-50%)	750 - 1300
Clad Damage (50-100%)	1300 - 1650
Fuel Over temperature	>1650
Or	
Fuel Melt	

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		TABLE 2	
		SUGGESTED SAMPLING LOCATIONS	
ACCIDENT	F CONDITION	SAMPLING LOCATIONS	COMMENTS
Small Break LC Rx Pow	DCA /er > 1%	RCS Hot leg and Containment Atmosphere Alternate RCS sample points: RCS Cold Legs or RCS Pressurizer	
Rx Pow	ver < 1%	RCS Hot Leg and Containment Atmosphere Alternate RCS sample points: RCS Cold legs or RCS Pressurizer or Residual Heat Removal Rump Discharge	If RCS is pressurized and RC pumps are running
		Kesidual freat Kenioval Fulip Discharge	II RCS ON KHR
Large Break LC Rx Pow	DCA ver > 1%	RCS Hot Leg and Containment Atmosphere and Containment Sump Alternate RCS sample points: RCS Cold legs or RCS Pressurizer	
Large Break I C		Containment Atmosphere and Containment Sump	Provided Containment Summ
Rx Pow	er <1%	Alternate RCS sample point: Residual Heat Removal Pump Discharge	Supplying Core Cooling Provided that RHR taking from Containment Sump

roved 2000		CORE DAMAGE ASSESSM	ENT	Page Number	
·····		TABLE 2 (CONT'D) SUGGESTED SAMPLING LOCATION	'S	1	
ACCII	DENT CONDITION	SAMPLING LOCATIONS	COMMENTS		
Steam Line Break		RCS Hot Leg and Containment Atmosphere Alternate RCS sample points: RCS Pressurizer or RCS Cold legs	If the containment atmosphere has increased or is increasing	monitor	
Steam Generator Tube Rupture		RCS Hot Leg and Main Steam and Containment Atmosphere Alternate RCS sample points: RCS Pressurizer or Alternate Main Steam sample point: Main Condenser Hot Well and	If the containment atmosphere has increased or is increasing	monitor	

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oproved 8/2000		CORE DA	MAGE ASS	SESSMENT	Page Number 14 of 42	
			TABLE 3			
		SELECTED NUCLIDES	S FOR CORE DA	MAGE ASSESSMENT		
Core Damage	Category	Category Nuclide Half-Life Predominant Gammas, keV Yield, (%) *				
Clad Failure		Kr-85m	4.4 h	150(74), 305(13)		
		Kr-87	76 m	403(84), 2570(35)		
		Kr-88	2.8 h	191(35), 850(23), 2400(35)		
		Xe-131m	11.8 h	164(2)		
		Xe-133	5.27 d	81(37)		
		Xe-133m	2.26 d	233(14)		
		Xe-135	9.14 h	250(91)		
		I-131	8.05 d	364(82)		
		I-132	2.26 h	773(89), 955(22), 1400(14)		
		1-133 1 125	20.3 h	530(90)		
		1-135	0.08 n	1140(37), 1280(34), 1460(12), 1720(19)		
		Rb-88	17.8 m	898(13), 1863(21)		
Fuel Over-Ter	mperature	Cs-134	2 y	605(98), 796(99)		
		Cs-137	30 y	662(85)		
		Te-129	68.7 m	455(15)		
		Te-132	77.7 h	230(90)	-	
E. D.C.I.		D 140				
ruel Melt		Ba-140	12.8 d	537(34)		
		La-140	40.22 h	487(40), 815(19), 1596(96)		
		La-142	92.5 m	650(48), 1910(9), 2410(15), 2550(11)		
			1			

* - Values obtained from Table of Isotopes, Lederer, Hollander, and Perlman, Sixth Edition.

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	TABLE 4 INGROWTH AND DECAY CORRECTION FACTORS (Curies) (time* (t) in hours)					
Kr-85m: Kr-87: Kr-88:	(EXP 0.157t) (1E-6) (EXP 0.547t) (1E-6) (EXP 0.247t) (1E-6)					
Xe-131m:	$\frac{(1E-6)}{[-2.62 \text{ EXP } (-3.54\text{E}-3)t] + [3.62 \text{ EXP } (-2.45\text{E}-3)t]}$					
Xe-133:	(1E-6) [-0.185 EXP - (3.41E - 2)t] - [0.10 EXP - (1.28E - 2)t] + [1.285 EXP - (5.48E - 2)t] + [1.28E - 2	3)t]				
Xe-133m:	$\frac{(1E-6)}{[-0.1 \text{ EXP} - (3.41 \text{ E} - 2)t] + [1.1 \text{ EXP} - (1.28 \text{ E} - 2)t]}$					
Xe-135:	$\frac{(1E-6)}{[-9.26 \text{ EXP} - (1.04 \text{ E} - 1)t] - [0.033 \text{ EXP} - (2.66)t] + [10.293 \text{ EXP} - (7.58 \text{ E} - 2)t]}$					
I-131:	(EXP 0.00359t) (1E-6)					
I-132:	$\frac{(1E-6)}{[0.103 \text{ EXP} - (8.91\text{ E} - 3)t] + [0.897 \text{ EXP} - (0.307)t]}$					
I-133: I-135: Cs-134:	(EXP 0.0341t) (1E-6) (EXP 0.104t) (1E-6) (1E-6) (1E-6)					
Te-129:	$\frac{(12^{-0})^{-0}}{[1.09 \text{ EXP} - (0.161)t] + [0.16 \text{ EXP} - (8.47\text{E} - 4)t] - [0.25 \text{ EXP} - (0.605)t]}$					
Te-132: Ba-140:	(EXP 0.00892t) (1E-6) (EXP 0.00225t) (1E-6)					
La-140:	$\frac{(1E-6)}{[1.09 \text{ EXP} - (2.25E-3)t] - [0.09 \text{ EXP} - (1.72E-2)t]}$					
La-142:	$\frac{(1E-6)}{[-0.14 \text{ EXP} - (3.78)t] + [1.14 \text{ EXP} - (0.449)t]}$					
Pr-144:	$\frac{(1E-6)}{[0.91 \text{ EXP} - (1.04 \text{ E} - 4)t] + [0.09 \text{ EXP} - (2.4)t]}$					

* Time, t is the number of hours between shutdown and time of sample count.

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TABLE 5

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DEFAULT NORMAL OPERATING ACTIVITY *

Nuclide	Reactor Coolant Specific
Kr-85m	1.1E-01
Kr-87	6.0E-02
Kr-88	2.0E-01
Xe-131m	1.1E-01
Xe-133	1.8E+01
Xe-135	3.5E-01
I-131	2.7E-01
I-132	1.0E-01
I-133	3.8E-01
I-135	1.9E-01

* Values obtained from ANS 18.1.

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Date Approved			
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TABLE 6

IODINE 131 ACTIVITY AVAILABLE FOR RELEASE DUE TO SPIKING PHENOMENON

Av I-	erage -131 S	Reacto pecific	r Cool: Activit	ant Y	Total I-131 Available For Release
	<u> </u>	(Ci/gra	<u>m)</u>		(Curies)
0.5	\leq	SA	<	1.0	3400
0.1	<	SA	<	0.5	380
0.05	<	SA	<	0.1	200
0.01	٤	SA	<	0.05	200
0.005	≤	SA	<	0.01	100
0.001	≤	SA	<	0.005	100
		SA	<	0.001	2

Where SA = Normal operating I-131 specific activity (μ Ci/gram) in the reactor coolant.

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CORE DAMAGE ASSESSMENT

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TABLE 7

NOBLE GAS AND RADIOIODINE ACTIVITY RATIOS OF GAP AND FUEL PELLET

Nuclide	Gap Activity Ratio	Fuel Pellet Ratio
Kr-85m	0.022	0.11
Kr-87	0.022	0.22
Kr-88	0.045	0.29
Xe-131m	0.004	0.004
Xe-133m	0.096	0.14
Xe-135	0.051	0.19
I-132	0.17	1.5
I-133	0.71	2.1
I-135	0.39	1.9

Where:

Noble Gas Patio	=	Total Activity of Noble Gas Isotope Released		
Noble Clas Kallo -	-	Total Activity of Xe - 133 Released		
Padioiodina Patio		Total Activity of Radioiodine Gas Isotope Released		
Kauloloume Katlo –		Total Activity of I - 131 Released		

<u>J.T. C</u>	Jasser	Vogtle Electric Generating Plant	91502-C 1
Date App 04/18	proved /2000	CORE DAMAGE ASSESSMENT	Page Number 19 of 42
		DATA SHEET 1 CORE DAMAGE ASSESSMENT SUMMARY	Sheet 1 of
А.	PREI	LIMINARY CORE DAMAGE ASSESSMENT	
	1.	RVLIS Indication:	
		No Core Uncovery	
		Uncovery Indicated Length Of Time Uncovered	
	2.	Core Exit Thermocouple Readings:	
		Maximum Core Exit Thermocouple Reading:	<u></u>
		Fuel Damage Category Based	
		On Thermocouple Temperatures	
	3.	Fuel Damage Based On Containment High Range Area Monitor	
	4.	Percent Zircaloy/Water Reaction	
	5.	CVCS Letdown Monitor (RE-48000)*	
	6.	Containment Process Radiogas Monitor (RE-2562C)*	····
	7.	Preliminary Core Damage Assessment Results	
	DATI	E: TIME: PERFORMED BY:	
		REVIEWED BY:	
В.	COR] (Post	E DAMAGE ASSESSMENT BASED ON ISOTOPIC ANALYSIS F Accident Sampling)	EPORT
	Recor	d Category of Fuel Damage Based on the following Radioisotopic Indic	ations:
	1.	Fission Products Present In Samples	
	2.	Fission Product Release Percentages	
	3. л	Radiolodine Ratio Damage Category	
	4.	Noble Gas Kallo Damage Calegoly	
C.	FINA	L CORE DAMAGE ASSESSMENT	
DAT	E:	TIME: PERFORMED BY:	
		REVIEWED BY:	
- If s	vstem]	has not been isolated.	
	J		



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CORE DAMAGE ASSESSMENT

Sheet 3 of 3

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DATA SHEET 1

CORE DAMAGE ASSESSMENT SUMMARY

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
NUCLIDE	PERCENT CLAD DAMAGE <50% ≥50%	PERCENT OVERTEMPERATURE <50% ≥50%	PERCENT FUEL MELT <50% ≥50%
Kr 85m			
Kr 87			
Kr 88			
Xe 131m			
Xe 133			
Xe 133m			
Xe 135			
I 131			
I 132			
I 133			
I 135			
Cs 134			
Te 129		·	
Te 132			
Ba 140			
La 140			· · · · · · · · · · · · · · · · · · ·
La 142			
Pr 144			

DATE: _____ TIME: _____

PERFORMED BY:

REVIEWED BY:

Approved By J.T. Gas	sser		Vogtle	e Electri	c Genera	ting Pla	nt 🔺	Procedure Number F 91502-C 1
Date Approv 04/18/20	red 100		CORE	DAM	AGE A	ASSES!	SMENT	Page Number 22 of 42
		• •	REACTO	DA' DR COOI	TA SHEE LANT SYS	T 2 STEM AC	ΓΙVITY	Sheet 1 of
A. F	OST-A	CCIDENT	REACTO	OR MAS	S DETER	MINATIO	N	
1	. A	dded Mass						
	Тс	otal	_*Gallon	s X 3,785	5 Grams/G	allon =	Grams	
2	. In	itial Mass						
	Er loa fo	ater 2.45E8 ad tempera llowing cor	Grams if ture and prection:	RCS was	in the ran If less tha	ge of no lo n no load	ad temperature and temperature and	and pressure to full d pressure, use the
	3.2	32E8 Gram	s X	_(Specifi	ic Gravity	of RCS At	Tavg [#]) = +	Grams
3	. То	otal Post-Ac	cident Re	actor Coo	lant Syster	n =	_Grams Mass	
		SP	ECIFIC GR/	avity				
	0.67	0.73 0.78	0.86	0.92	0.96	1.0		
	600 NC	500	400	300	200	100		
		WAT	ER TEMPER	RATURE, ('	'F)			
*	From 91	503-C - Da	ita Sheet 2					
#	No load	temperature	e and press	sure are 5	57°F and 2	235 psig r	espectively.	

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		L	DATA SHEET 2		Sheet 2 of 2
D DCS	• ст		TIAN		
D. NUG	AUI.				
ELAPSED 7	ГIME	, HOURS,		RCS MASS, GM	
SHUTDOW	NTC) SAMPLE COUNT		(From Data Sheet 2, She	et 1 of 2)
COL 1		COL 2	COL 3	COL 4	COL 5
	ME	ASURED	INGROWTH/DECAY	INGROWTH/DECA	Y RCS
NUCLIDE	CO	NCENTRATION	CORRECTION	CORRECTED	ACTIVITY,
	μ C i	i/gram	FACTOR	CONCENTRATION	Ci
				Ci/gram	· [
Kr 85m	<u> </u>				
Kr 87	_				
Kr 88	<u> </u>				
Xe 131m	<u> </u>				
Xe 133	_				
Xe 135					
I 131	<u> </u>				
1132	┥				
1155 T 125					
1135	+				
US 134 To 120					
Te 132			+	·····	
Ra 140					
La 140	 				
La 142					
Pr 144	1				
	4			<u> </u>	
DATE:		TIME:	PERFORMED BY	<i>l</i> :	
			··· ··· ··· ··· ··· ··· ··· ··· ··· ··		
			REVIEWED BY:		

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DATA SHEET 3

Sheet 1 of 1

CONTAINMENT ATMOSPHERE ACTIVITY

CONTAINMENT VOL, (7.9 E10 CC)

ELAPSED TIME, HOURS, SHUTDOWN TO SAMPLE COUNT _____

COL 1	COL 2	COL 3	COL 4	COL 5
NUCLIDE	MEASURED CONCENTRATION μCi/cc	INGROWTH/DECAY CORRECTION FACTOR	INGROWTH/DECAY CORRECTED CONCENTRATION Ci/cc	CONTAINMENT ACTIVITY, Ci
Kr 85m				,
Kr 87				· · · · · · · · · · · · · · · · · · ·
Kr 88				
Xe 131m				
Xe 133				
Xe 135				
I 131				
I 132				
I 133			·	
I 135				
Cs 134				
Te 129				
Te 132				
Ba 140				
La 140				
La 142				
Pr 144				
	TIME	DEDEODMEDI	ov.	

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Date Approved
04/18/2000

DATA SHEET 4

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ADDITIONAL ACTIVITY RELEASED FROM CORE CALCULATION

ELAPSED TIME, HOURS, SHUTDOWN TO SAMPLE COUNT _____ MASS OR VOLUME, GM/CC

COL 1	COL 2	COL 3	COL 4	COL 5
NUCLIDE	MEASURED CONCENTRATION μCi/g(cc)	INGROWTH/DECAY CORRECTION FACTOR	INGROWTH/DECAY CORRECTED CONCENTRATION Ci/g(cc)	ACTIVITY RELEASED, Ci
Kr 85				•
Kr 85m				
Kr 87				
Kr 88				
Xe 131m				
Xe 133				
Xe 135				
I 131				
I 132				
I 133				
I 135				
Cs 134				
Te 129				
Te 132				
Ba 140				
La 140				
La 142				
Pr 144				

DATE: _____ TIME: _____

PERFORMED BY:

REVIEWED BY:

Approved By J.T. Gasser		Vogtle	Electric Generati	ng Plant 🛕		Procedure Number Rev 91502-C 11
Date Approved 04/18/2000		CORE D	AMAGE A	SSESSMEN	NT	Page Number 26 of 42
		RELEASE ACT	DATA SHEET 5	ACTIVITY RELEASED		Sheet 1 of 1
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7
NUCLIDE	RCS, Ci	CONTAINMENT ATMOS, CI	ADDITIONAL SOURCES, CI	TOTAL ACTIVITY RELEASED, Ci	TOTAL CORRECTED CORE INVENTORY, CI	RELEASE PERCENTAGE
Kr 85m	+	+	=	÷	X 100	=
Kr 87	÷	+	=	÷	X 100	= ·
Kr-88	+	+	=	÷	X 100	= .
Xe 131 m	+	+	=	÷	X 100	=
Xe 133	+	+	=	÷	X 100	= .
Xe 135	+	+		÷	X 100	=
1 131	+	+	—	÷	X 100	2
l 132	+	+	=	÷	X 100	=
133	+	+	=	÷.	X 100	=
l 135	. +	+		÷	X 100	=
Cs 134	+	+	=	÷	X 100	=
Te 129	+	+	=	÷	X 100	=
Te 132	+	+		÷	X 100	#
Ba 140	+	+		÷	X 100	
La 140	+	+	=		X 100	=
La 142	+	+	=		X 100	=
Pr 144	+	+		÷	X 100	=
DATE:	TIME:		PERFORMED BY: REVIEWED BY:			·

CORE DAMAGE ASSESSMENT

Sheet 1 of 2

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ENCLOSURE 1

INSTRUCTIONS FOR UTILIZATION OF PERCENT CLAD DAMAGE, PELLET OVERTEMPERATURE, AND FUEL MELT

- 1.0 Obtain estimated core burn-up from Procedure 91504-C, "Core Inventory Determinations Using Reactor Power History" Data Sheet 12, and use correct set of burn-up graphs as follows:
- 1.1 If the core burn-up is less than 5,000 MWD/MTU, use bottom line of appropriate graph.
- 1.2 If the core burn-up is between 5,000 and 25,000 MWD/MTU, use middle line of appropriate graph.
- 1.3 If the core burn-up is greater than 25,000 MWD/MTU, use top line of appropriate graph.
- 1.4 If iodine spiking is indicated, use appropriate graph.
- 1.5 Obtain release percentage values from column 7 of Data Sheet 5, "Release Activity and Percentage Activity Released".
- 1.6 Enter each graph with the corresponding release percentage value to obtain the percent clad damage estimate. Record the percentage clad damage values on Data Sheet 1, Sheet 3, "Core Damage Assessment Summary".
- 2.0 To determine percent fuel overtemperature, select the correct set of bar graphs as follows:
- 2.1 If the core burn-up is less than 5,000 MWD/MTU, use "Low Burn-up Bar Graphs".
- 2.2 If the core burn-up is between 5,000 and 25,000 MWD/MTU, use "Average Burn-up Bar Graphs".
- 2.3 If the core burn-up is greater than 25,000 MWD/MTU use "High Burn-up Bar Graphs".
- 2.4 Obtain percent inventory released values from column 7 of Data Sheet 5, "Release Activity and Percentage Activity Released".
- 2.5 Enter each bar graph with the corresponding release percentage value to obtain the percentage of fuel overtemperature estimate. Record the percentage fuel overtemperature value on Data Sheet 1, Sheet 3, "Core Damage Assessment Summary".

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	ENCLOSURE 1	Sheet 2 of 2
	INSTRUCTIONS FOR UTILIZATION OF PERCENT CLAD DAMAGE, PELLET OVERTEMPERATURE, AND FUEL MEL	T
3.0	To determine the percent fuel melt, select correct set of bar graphs as follow	'S:
3.1	If the core burn-up is less than 5,000 MWD/MTU, use "Low Burn-up Graph	ns".
3.2	If the core burn-up is between 5,000 and 25,000 MWD/MTU, use "Average Graphs".	e Burn-up Bar
3.3	If greater than 25,000 MWD/MTU, use "High Burn-up Graphs".	
3.4	Obtain percent inventory released values from column 7 of Data Shee Activity and Percentage Activity Released".	t 5, "Release
3.5	Enter each bar graph with the corresponding release percentage value percent fuel melt estimate. Record the percentage fuel melt values on Data 3, "Core Damage Assessment Summary".	to obtain the Sheet 1, Sheet
3.6	Return to Step 5.6 in Procedure.	

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	Approved By J.T. Gasser Vogtle Electric Generating Plant	Procedure Number R	1
	Date Approved 04/18/2000 CORE DAMAGE ASSESSMENT	Page Number 42 of 42	
	PERCENT CORE INVENTORY RELEASED VERSUS PERCENT FUEL MELT FOR HIGH BURN-UP CASE		
	Core Inventory Released, (%) For Kr, Xe, I, Cs and Te		
	1E2 1E2 0E1 0E1 0E1 0E1 0E1 0E1 0E1 0E1 0E0 0E0		
	Fuel Meit, (%)		
)	Core Inventory Released, (%) For Ba and Sr		
	11E2 11E3 8E1 11E 9E1 11E 9E1 11E 9E0 11E		
	Fuel Mett, (%)		
	Core Inventory Released, (%) For Pr		
	5E0 5E0 5E0 5E1 5E1 5E1 5E1 5E1 5E1 5E2 5E2 5E2 5E2 5E2 5E2 5E2 5E2		
	1EC 2E EC 3E EC 6E E1 6E E1 1EC 6E E1 6E E1		
)			

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Southern Nuclear Operating Company Nuclear Operations P.O. Box 1600 Waynesboro, Georgia 30830 Telephone 706-724-1562 706-554-9961



RECORDS SUBMITTAL FORM

Submittal No. EP-00-06

TO: DOCUMENT CONTROL

The documents described below are being submitted to you for storage. Documents which contain a Safety Evaluation (Part B) are indicated by a mark in the SE column.

Document Number	Rev	SE	Document Description
91105-C	11		"Duties of the EOF Manager"
			3 pages of documentation
91202-C	11		"Activation and Operation of the Operations Support Center"
			3 pages of documentation
91502-C	11		"Core Damage Assessment"
			3 pages of documentation
91504-C	09		"Core Inventory Determinations Using Reactor Power History"
			3 pages of documentation
			DECEIVED
			APH 27 2000

Remarks: Printed copies compared to originals in Document Control.

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Received By: (Docum

Emergency Preparedness Department

04/27/2000 Date

Figure 2 (Example)

PRB REVIEW REQUIRED

1.0 <u>PURPOSE</u>

1.1 This procedure provides instructions and Data Sheets necessary for manual determination of fission product core inventories. These estimates, based on Reactor Power History, are used in post-accident core damage assessment and represent inventories at the time of reactor shutdown prior to a core damage accident. Inventories may also be determined by computer using approved software.

2.0 <u>PRECAUTIONS AND LIMITATIONS</u>

- 2.1 The reactor power fluctuations of no more than plus or minus ten percent of the recorded power level values, are acceptable within any power level period.
- 2.2 The length of Reactor Power History required for determining core inventories varies with each nuclide used in the assessment. A reactor power history equal to at least four (4) times the half-life of the nuclide is required and is specified below Column 2 of each Reactor Power History Data Sheet.

3.0 <u>PREREQUISITES</u>

An emergency condition has been declared and core damage is suspected.

4.0 <u>RESPONSIBILITIES</u>

- 4.1 It is the responsibility of the Technical Support Center (TSC) Engineering Supervisor to execute this procedure and to coordinate the core damage assessment actions.
- 4.2 The TSC Engineering Supervisor is also responsible to review completed core damage assessment, Procedure 91502-C, Core Damage Assessment".
- 4.3 The Reactor Engineer assigned to the TSC should normally perform these duties under the direction of the TSC Engineering Supervisor.

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Date Approved
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CORE INVENTORY DETERMINATIONS USING REACTOR POWER HISTORY

5.0 <u>MAIN BODY</u>

5.1 INSTRUCTIONS

NOTE

If this procedure is being performed on a reload core with zero MWD/MTU cycle burn-up, then the power history will include operation during the previous cycle. This will require the fission product inventories to be adjusted for the fraction of fuel assemblies which were used in the previous cycle. Specifically, multiply results by (number of fuel assemblies from previous cycle) \div (total number of fuel assemblies).

NOTE

The automated core damage spreadsheet may be used in lieu of the manual method when performing core damage assessment.

- 5.1.1 Obtain Reactor Power History for at least the last 1230 hours (51 days), in units of percent rated full power from Reactor Engineering Power History and Burn up Log. Divide the Power History into a series of periods in which the reactor power varied no more than ±10% from its mean for that period.
- 5.1.2* Enter reactor power level as percent of rated full power in Column 1 of Data Sheets 1 through 11 and 13 through 18.
- 5.1.3* For each percent power level value entered in Column 1 of Data Sheets 1 through 11 and 13 through 18, enter the duration at this power, in hours, in Column 2. The power level and duration values should be for a time period equal to or slightly greater than the minimum time indicated below Column 2 to be used for calculation purposes.
- 5.1.4 Data Sheet 12 is used to determine the power correction factor for Cs-134. To use Data Sheet 12, the average power during the entire operating period is required. (Due to the production characteristics of Cs-134, a different method must be used in determining the power correction factor.) If using the core damage assessment spreadsheet, enter Total Corrected Core Activity for Cs-134 on spreadsheet.
- * Denotes manual completion of the step is not required if the automated spreadsheet is used.

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Approved By J.T. Gasser	Vogtle Electric Generating Plant	Procedure Number Rev 91504-C 9						
Date Approved 04/18/2000	CORE INVENTORY DETERMINATIONS USING REACTOR POWER HISTORY	Page Number 3 of 21						
	λιωτη							
	NUIE							
	If using core damage assessment spreadsheet go to step 5.1.12 of this procedure.							
5.1.5	Enter into Column 3, of each Data Sheet, the time between the end of each recorded in Column 1 and the time at which reactor shutdown occurred, in l	1 power period hours.						
5.1.6	Using the bar graph provided for each nuclide, determine the Factor A a each time value in Column 3. Record each Factor A in Column 4.	ssociated with						
5.1.7	Using the bar graph provided for each nuclide, determine the Factor B as each time value, recorded in Column 2. Record each Factor B in Column 5	ssociated with						
5.1.8	Multiply each respective power level (Column 1) with its correspond (Column 4) and Factor B (Column 5), to obtain the product of percent pow product in Column 6.	ling Factor A wer. Enter the						
5.1.9	Add the products in Column 6 to determine the power correction factor value below Column 6.	and enter the						
5.1.10	Calculate the core inventory for each nuclide by multiplying the power co from Sub-subsection 5.1.8 by the respective nuclide factor given on the Dat	rrection factor a Sheet.						
5.1.11	Enter the product obtained on the line labeled "Total Corrected Activity".							
5.1.12	Execute Procedure 91502-C, "Core Damage Assessment".							
6.0	REFERENCES							
6.1	Westinghouse Owner's Group Post Accident Core Damage Assessment Revision 2, November, 1984.	Methodology,						
6.2	PROCEDURES							
6.2.1	91502-C, "Core Damage Assessment"	· · · · · · · · · · · · · · · · · · ·						
6.2.2	91503-C, "Control Room Instrumentation Output For Assessment Of Damage"	Core						
	END OF PROCEDURE TEXT							
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Approved By J.T. Gasser	Vog	tle Electric Ge	enerating Plan	n A	Procedure Number 91504-C	1
Date Approved 04/18/2000	CORE INVENTO	RY DETERMINATIO	ONS USING REACT	OR POWER HISTORY	Page Number 4 of 2	21
REAC	FOR POWER HIS	DATA S STORY AND C	HEET 1 ORE INVENTO	ORY DETERMINA	Sheet 1	. 0
		NUCLIDE	: <u>Kr 85m</u>			
Column 1 Average Power Level	Column 2 Duration At Power	Column 3 Shutdown To End Of Power	Column 4 Factor A	Column 5 Factor B	Column 6 Product %P x A x B	
(% P)	(Hours)	(Hours)				
Duration =	*	Power C	Correction Factor	$\sum P_i x A_i x B_i = $		
*Must be at le	east <u>17.6</u> hours	Fac	tor A	i		
		3 2	1.5 1	0.7 0.5	0.3	
Time From	m Column 3 (Hours)	$ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $		15 16 17 18 19	20 21	
	$\begin{array}{c c} 1 & \text{Column 2} (\text{Hours}) \\ \hline 1 & 1 & 1 \\ \hline 3 & 4 & 5 & 6 \end{array}$	7 8	9.0	9.3 9.5	<mark>-∤↓-</mark> 9.7	
		Fac	tor B			
Core Inventor	y = 2.10E3 X	PCF, col 6 sum	_= Total Corr	ected Core Activity	_Curies	
DATE:	TIME:	P	ERFORMED BY	7:		

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roved By F. Gasser e Approved /18/2000	Vog Core inventoi	Procedure Numb 91504-C Y Page Number 5:01			
/18/2000		DATA S	HEET 2		Sheet
REACT	OR POWER HIS	STORY AND CO)RE INVENTO E: <u>Kr 87</u>	RY DETERMIN	IATION
Column 1 Average Power Level	Column 2 Duration At Power	Column 3 Shutdown To End Of Power	Column 4 Factor A	Column 5 Factor B	Column 6 Product %P x A x B
(% P)	(Hours)	(Hours)			
Duration = *Must be at le	*	Power C Fac	Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	
10 9 8 Time Time Time	7 6 5 4 From Column 3 (Ho 1 1 1 From Column 2 (Ho 1 1 From Column 2 (Ho	$\begin{array}{c c} 3 & 2 \\ \hline \\ $	1.5 1 1.5 1 3	$\begin{array}{cccc} 0.7 & 0.5 \\ 1 & 1 & 1 \\ 4 & 1 & 5 \\ \end{array}$	
	 3 4 5 6		9.0	9.3 9.5	
Core Inventor	y = <u>3.83E3</u> X	Fac PCF, col 6 sum	tor B _= Total Corr	rected Core Activi	Curies

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Approved By J.T. Gasser	Vog	tle Electric Ge	enerating Pla	nt. 🛕	Procedure Number Ro 91504-C 9
Date Approved 04/18/2000	CORE INVENTO	RY DETERMINATIO	ONS USING REACT	OR POWER HISTORY	Page Number 6 of 21
	·	Ο ΠΑΤΑ Ο	нггт 2		Sheet 1 of
		DATAS	HLLI J		
REAC	FOR POWER HIS	STORY AND C	ORE INVENTO	ORY DETERMINA	TION
		NUCLID	E: <u>Kr 88</u>		
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Average	Duration At Power	Shutdown To End Of		Factor B	Product Product
Level	Allower	Power			
(% P)	(Hours)	(Hours)			- 11,
Duration	*	D			
Duration =		Power C	orrection Factor	$\sum_{i} P_i x A_i x B_i = $	
*Must be at l	east 11.2 hours			•	
		Fac	tor A		
10 9 8	7 6 5 4	3 2	1.5 1	0.7 0.5	0.3
		<u> </u>			
	rom Column 3 (Hour	s) 		<u> </u>	
	1 2 3 4	↓ ↓ ↓	7 8 9	10 11 12 1	13 ¹ 4
	om Column 2 (Hour	s) ll	I	┍┸┰╌╌┞╌╌╌┦	
0 1 2	3 4 5 6	7 8	9.0	9.3 9.5	9.7
		Fac	tor B		
_			_		Couries
Coro Inventor	$y = 3.43E3 A_{$		 Total Com	rected Core Activity	Curies
Core Inventor	l	PCF, col o sum	Total Coll		
Core Inventor	TIME	: I	PERFORMED B	Y:	

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JATA SHEET 4 DATA SHEET 4 REACTOR POWER HISTORY AND CORE INVENTORY DETERMINATION NUCLIDE: Xe 131m Column 1 Column 2 Column 3 Column 4 Column 5 Colum Average Duration Shutdown Factor Factor Prod Power At Power To End Of A B %P x. A (% P) (Hours) (Hours) — — — (% P) (Hours) (Hours) — — — Duration =* Power Correction Factor $\sum P_i xA_i xB_i =i$ * * Yes and the st to the st	4-C umber
DATA SHEET 4 REACTOR POWER HISTORY AND CORE INVENTORY DETERMINATION NUCLIDE: Xe 131m Column 1 Column 2 Column 3 Column 4 Column 5 Column 7 Average Duration Shutdown Factor Factor Prod Average Duration Shutdown Factor Factor Prod (% P) (Hours) (Hours)	• 7 of 2
REACTOR POWER HISTORY AND CORE INVENTORY DETERMINATION NUCLIDE: Xe 131m Column 1 Column 2 Column 3 Column 4 Column 5 Column 7 Average Duration Shutdown Factor Factor Factor Prod Power At Power To End Of A B %P x A (% P) (Hours) (Hours)	Sneet 1
NUCLIDE: Xe 131m Column 1 Column 2 Column 3 Column 4 Column 5 Colum 9 Power At Power To End Of A B %P x A (% P) (Hours) (Hours)	
Column 1 Column 2 Column 3 Column 4 Column 5 Column 7 Average Duration Shutdown Factor Factor Prod Power At Power To End Of A B %P x A (% P) (Hours) (Hours)	
(% P) (Hours) (Hours) (% P) (Hours)	in 6 ict x B
$Duration = * Power Correction Factor \sum P_i x A_i x B_i = \i*Must be at least 1132 hoursFactor A$	
$Duration = * Power Correction Factor \sum_i P_i x A_i x B_i = \i$ *Must be at least 1132 hours Factor A $10 9 8 7 6 5 4 3 2 1.5 1 0.7 0.5 0.3$	
$Duration = * Power Correction Factor \sum P_i x A_i x B_i = \i*Must be at least 1132 hoursI0 9 8 7 6 5 4 3 2 1.5 1 0.7 0.5 0.3$	
$Duration = \ * Power Correction Factor \sum_{i} P_{i}xA_{i}xB_{i} = \i *Must be at least 1132 hours Factor A 10 9 8 7 6 5 4 3 2 1.5 1 0.7 0.5 0.3 I = I = I = I = I = I = I = I = I = I =$	
Duration =* Power Correction Factor $\sum_{i} P_i x A_i x B_i =i$ *Must be at least 1132 hours Factor A 10 9 8 7 6 5 4 3 2 1.5 1 0.7 0.5 0.3 10 1 9 8 7 6 5 4 3 2 1.5 1 0.7 0.5 0.3	
Duration =* Power Correction Factor $\sum_{i} P_i x A_i x B_i =i$ *Must be at least 1132 hours Factor A 10 9 8 7 6 5 4 3 2 1.5 1 0.7 0.5 0.3 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Duration =* Power Correction Factor $\sum_{i} P_{i}xA_{i}xB_{i} =i$ *Must be at least 1132 hours Factor A 10 9 8 7 6 5 4 3 2 1.5 1 0.7 0.5 0.3 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 +	
*Must be at least $\underline{1132}$ nours Factor A 10 9 8 7 6 5 4 3 2 1.5 1 0.7 0.5 0.3 $\begin{array}{cccccccccccccccccccccccccccccccccccc$	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
Time From Column 3 (Hours)	
Image: Construction Image: Construction	0
1 1 <td></td>	
Factor B	
Core Inventory = <u>6.03E1</u> X = Curi PCF, col 6 sum Total Corrected Core Activity	es
DATE: TIME: PERFORMED BY:	

J.T. Gasser	Vog	tle Electric G	enerating Pla	nt 🛃	91504-C
Date Approved	CORE INVENTOR	RY DETERMINATIO	ONS USING REACT	OR POWER HISTOR	Y Page Number 8 of
		DATA S	HEET 5		Sheet
REACT	OR POWER HIS	STORY AND C	ORE INVENTO)RY DETERMIN	ATION
		NUCLIDI	3: <u>Xe 133</u>		• ,
Column 1 Average Power	Column 2 Duration At Power	Column 3 Shutdown To End Of	Column 4 Factor A	Column 5 Factor B	Column 6 Product %P x A x B
Level	(Hours)	Power (Hours)			
·					
<u> </u>		<u> </u>		<u> </u>	
Duration =	*	Power (Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = $	
*Must be at le	ast <u>506</u> hours:	Fa	tor A	-	
10 9 8 		3 2	1.5 1		0.3
^I Time Fro	m Column 3 (Hours	s) ' · ·			· ·
l ₀ ı Time Frc I	۲۵۵ m Column 2 (Hours)	⁻¹ 200 ¹ 3 3)	300 ¹ 400) ^I 500	¹ 600
		- <mark></mark>		1 1 1 1 1 0 9.3 9.5	9.7
		Fac	tor B:		-
Core Inventor	y = <u>1.91E4</u> X	PCF col 6 sum	_= Total Cor		Curies
			10001-00-		ly

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J.T. Gasser Date Approved	Vog Core inventor	Procedure Number 91504-C Y Page Number	Rev 9			
04/18/2000					9 of 2	21
BEAC	TOR POWER HIS	DATA S	HEET 6	DV NETEDMIN	Sheet 1	. of 1
NEAC)		NUCLIDE	: <u>Xe 133m</u>			
Column 1 Average Power Level	Column 2 Duration At Power	Column 3 Shutdown To End Of Power	Column 4 Factor A	Column 5 Factor B	Column 6 Product %P x A x B	
(% P)	(Hours)	(Hours)				
Duration =	*	Power C	Correction Factor	$\sum_{i} P_i x A_i x B_i = $		
*Must be at le	east <u>217</u> hours	Fac	tor A	1		
10 9 Time F 	8 7 6 5 4 	3 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		0.7 0.5 1 1 1 1 1 1 1 1 1 1 1 200	0.3 	
	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1 1 1 1 1 1 7 8	9.0	9.3 9.5	<mark> </mark>	
		Fac	tor B			
Core Inventor	y = 2.68E3 X	PCF, col 6 sum	_= Total Corr	ected Core Activit	Curies y	
DATE:	TIME:	PEF	FORMED BY: _			

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T. Gasser		tle Electric Ge	nerating Plan		91504-C
1/18/2000	CORE INVENTO	RYDEIERMINATIC		OR POWER HISTORY	10 of 2
		DATA S	HEET 7		Sheet 1
· REAC	FOR POWER HI	STORY AND CO	ORE INVENTO	DRY DETERMIN	ATION
			. V. 125		
		NUCLIDE	: <u>Ae 135</u>		
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Average	Duration	Shutdown	Factor	Factor	Product
Power	At Power	To End Of	Α	B	%P x A x B
Level		Power			
(% P)	(Hours)	(Hours)			
			·		
				<u> </u>	
		· ·			
Duration =	*	Power C	orrection Factor	$\sum_{i} P_i x A_i x B_i = $	
*Must he at l	east 36.6 hours			1	
Must be at h	east <u>50.0</u> nours	Fac	tor A		
1098	7654	3 2	1.5 1		0.3
		<u> </u>	l		
		s) 			.
10 I I I		, ' 20	l ₃	1 Iz	10 I
	om Column 2 (Hours	S)			. 1
┝╌╁┸┯┨┙		<u> </u>		········	<u>_</u>
012	3456	7 8	9.0	9.3 9.5	9.7
		Fac	tor B		
Core Invento	T = 3.54E2 V		_		Curico
	y – <u>5.54E5</u> A]	PCF, col 6 sum	 Total Corr	rected Core Activit	Curies
				· · · · · · · · · · · · · · · · · · ·	-
				. 7	

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I. Gasser	Vog	tle Electric G	enerating Pla	mt 🛦	Procedure Number 91504-C
te Approved /18/2000	CORE INVENTO	Page Number 11 of 2			
			SHEFT 8		Sheet 1
		DAIAC	SHEET O		
REACT	OR POWER HIS	STORY AND C	ORE INVENT	ORY DETERMIN	ATION
		NUCLII	DE: <u>I 131</u>		
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Average	Duration	Shutdown	Factor	Factor	Product
Power	At Power	To End Of	A	B	%P x A x B
Level		Power			
(% P)	(Hours)	(Hours)			
		·			
Duration = *Must be at le	* east <u>773</u> hours	Power (Fac	Correction Facto	$\frac{\sum P_i x A_i x B_i}{i} = \underline{\qquad}$	
10 9 8	7654	3 2	1.5 1	0.7 0.5	0,3
10 9 8	7 6 5 4 1 1 1 1 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	3 2 			0.3
10 9 8	7 6 5 4	3 2 			0.3
10 9 8 Time Fro	7 6 5 4 	3 2 1 1 300 400	1.5 1 1 1 1 500 600	0.7 0.5 1 1 1 1 1 700 800 9	0.3
10 9 8 Time Fro	7 6 5 4 	3 2 	1.5 1 1 1 1 500 600	0.7 0.5 1 1 1 1 	0.3 00
10 9 8 Time From 0 Time From 0 1 2	7 6 5 4 7 6 5 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	3 2 300 400	1.5 1 1.5 1 1.	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0.3
10 9 8 Time Fro	7 6 5 4 7 6 5 4 7	3 2 300 400 300 400 1 1 7 8	1.5 1 1 1 1 500 600 9.0	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0.3
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	7 6 5 4 7 6 5 4 7 7 7	3 2 300 400 300 400 1 1 7 8 Fac	1.5 1 500 600	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0.3
10 9 8 Time From 0 Time From 0 10 9 8 Time From 0 1 2	7 6 5 4 1 1 1 1 200 100 200 100 200 100 200 100 200 1 1 1 1 3 4 5 6	3 2 300 400 300 400 1 1 7 8 Fac	1.5 1 1.5 1 500 600 9.0 ctor B	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0.3 00
10 9 8 Time Fro	7 6 5 4 Tom Column 3 (Hours 100 200 Tom Column 2 (Hours 100 200 Tom Column 2 (Hours 1 1 1 1 3 4 5 6 y = 9.38E3 X	3 2 300 400 300 400 7 8 Fac	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0.3
$ \begin{array}{c} 10 & 9 & 8 \\ & & \\ Time From \\ 0 \\ & \\ 0 \\ 1 \\ 2 \end{array} $ Core Inventor	7 6 5 4 1 1 1 1 200 200 200 200 200 200 200 20	3 2 300 400 300 400 7 8 Fac	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0.7 0.5 	0.3

proved By T. Gasser te Approved I/18/2000	Vogf Core inventoi	t le Electric Ge ry determinatic	nerating Plan	IT A	Procedure Number 91504-C Y Page Number 12 of 2
	• • •	DATA S	HEET 9	<u> </u>	Sheet 1
REACT	OR POWER HIS	STORY AND C(ORE INVENTO	RY DETERMIN	ATION
		NUCLID	E: <u>I 132</u>		
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Average Power	Duration At Power	Shutdown To End Of Power	Factor A	Factor B	Product %P x A x B
(% P)	(Hours)	(Hours)			
Duration =	*	Power C	orrection Factor	$\sum P_i x A_i x B_i = $	
*Must be at lea	ast <u>9</u> hours			i	
	_	Fact	tor A		
		3 2 	1.5 1 		0.3
Time From	n Column 3 (Hours)	· · ·			· I
1 ₀ Time Fror	1 ¹ 2 ¹ 3 m Column 2 (Hours)	4 ⁵	¹ 6 ¹ 7	1 ₈ 1 ₉ 1	10 11
				<u></u>	<u> </u>
0 1 2	3 4 5 6	7 8	9.0	9.3 9.5	I 9.7
		Fact	tor B		
Core Inventory	$r = \underline{1.34E4} X \underline{\qquad} F$	CF, col 6 sum	_= Total Corr	rected Core Activit	Curies
ΓΛΤΕΙ	TIME	. D	Ένευργίευ Β.	۲.	5
	TIME	. р	FREORMED B	٧٠	

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CORE INVENTOR	RY DETERMINATIO	ONS USING REACT	OR POWER HISTORY	/ Page Number
				13 of 2
	DATA SI	HEET 10		Sheet 1
OR POWER HIS	STORY AND CO	DRE INVENTO	ORY DETERMIN	ATION
	NUCLID	E: <u>I 133</u>		
Column 2 Duration At Power	Column 3 Shutdown To End Of Power	Column 4 Factor A	Column 5 Factor B	Column 6 Product %P x A x B
(Hours)	(Hours)			
*	Power C	orrection Factor	$\Sigma P: xA: xB: =$	
et 81 hours	100010		i	
st <u>or</u> nours	Fac	tor A		
654	3 2	1.5 1	0.7 0.5	0.3
Column 3 (Hours)				<u>+</u>
20 3		50 60	70 80 9	0 100
Column 2 (Hours)		1		11
4 5 6	7 8	9.0	9.3 9.5	9.7
	Fac	tor B		
= <u>1.91E4</u> X P	CF, col 6 sum	= Total Corr	rected Core Activit	Curies y
TIME:	р	ERFORMED B	Y:	
	Column 2 Duration At Power (Hours) (Hours) (Hours) = = = = = = = = = =	NUCLID Column 2 Column 3 Duration Shutdown At Power To End Of Power (Hours) (Hours) (Hours) (Hours) (Hours) (Hours) (Hours)	NUCLIDE: 1133 Column 2 Column 3 Column 4 Duration Shutdown Factor At Power To End Of A (Hours) (Hours)	NUCLIDE: 1133 Column 2 Duration At Power Column 3 Shutdown To End Of Power Column 4 Factor A Column 5 Factor B (Hours) (Hours)

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pproved By .T. Gasser	Vog	tle Electric Ge	nerating Plan	nt A	Procedure Number 91504-C
ate Approved 4/18/2000	CORE INVENTO	Page Number 14 of 21			
		Sheet 1 o			
DFACT	OD DOWED UI	STODV AND CO	DE INVENTO	DV DETEDMIN	ΑΤΙΩΝ
REAC I	UK FUWEK HI				ATION
	••••••••••••••••••••••••••••••••••••••	NUCLID	E: <u>1135</u>		· · · · · · · · · · · · · · · · · · ·
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Average	Duration At Device	Shutdown To End Of	Factor	Factor	Product
Fower Level	At Power	Power	A	В	%PXAXB
(% P)	(Hours)	(Hours)			
(70 Г)		(Hours)			
					·····
	1				
Duration -	×	Derror C			
	••	Power C	orrection Factor	$\sum_{i} P_i X A_i X B_i = $	<u> </u>
*Must be at le	ast 27 hours			1	
		Fact	tor A		
10 0 0				0.7	
10 9 8	7654	3 2	1.5 1		0,3
	om Column 3 (Hol I	urs)	1	1	1
Time Fı	om Column 2 (Hou	urs)	20	20	50
┟┈╷┟╴└					
		· -7 0			'
V I 2	3456	/ 0	9.0	9.3 9.5	9.7
		Fact	or B		
Core Inventory	x = 1.72E4 X		-		Curies
	<u> </u>			anta d Claura A stisti	Curres
	ł	CF, col 6 sum	1 otal Corr	ected Core Activit	V
	ł	CF, col 6 sum	I otal Corr	ected Core Activit	y



J.T. Gasser	Vog	tle Electric Ge	enerating Plan	it 🔬	Procedure Number 91504-C
Date Approved 04/18/2000	CORE INVENTO	RY DETERMINATIO	ONS USING REACTO	OR POWER HISTO	RY Page Number 16 of
		DATA SI	LIDET 12		Sheet
		DATA SI	HEET 13		
· REACT	OR POWER HIS	STORY AND C	ORE INVENTO	RY DETERMI	NATION
		NUCLIDI	E: Te 129		
		1			
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Power	At Power	To Frd Of		R	%P x A x B
Level		Power	11	D	
(% P)	(Hours)	(Hours)			
					•
				····	
		· · · · · · · · · · · · · · · · · · ·			
Duration =	*	Power (Orrection Factor	$\sum \mathbf{P} \cdot \mathbf{v} \mathbf{A} \cdot \mathbf{v} \mathbf{R} \cdot =$	
Duration =	*	Power C	Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	
Duration = *Must be at lea	* ast <u>5</u> hours	Power C	Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	
Duration = *Must be at lea	* ast <u>5</u> hours	Power C Fac	Correction Factor	$\sum_{i} P_i x A_i x B_i = \i$	
Duration = *Must be at lea	* ast <u>5</u> hours	Power C Fac	Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = $	0.2
Duration = *Must be at leas $10 \ 9 \ 8$	ast 5 hours 7 6 5 4	Power C Fac 3 2	Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	0.3
Duration = *Must be at lease $10 \ 9 \ 8$	ast 5 hours 7 6 5 4 From Column 3 (Ho	Power C Fac 3 2 1 1 ours)	Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	0_3
Duration = *Must be at lease $10 \ 9 \ 8$ Time	ast <u>5</u> hours 7 6 5 4 1 1 1 From Column 3 (Ho	Power C Fac 3 2 Jurs)	Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	
Duration = *Must be at lease $10 \ 9 \ 8$ $10 \ 10 \ 9 \ 8$ $10 \ 10 \ 10 \ 10 \ 10 \ 10 \ 10 \ 10 \$	ast <u>5</u> hours 7 6 5 4 1 1 1 From Column 3 (Ho 1 From Column 2 (Ho	Power C Fac 3 2 J J ours) 2 ours)	Correction Factor etor A 1.5 1 1.5 1 1	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	0.3
Duration = *Must be at lease $10 \ 9 \ 8$ $10 \ 9 \ 8$ Time 0 Time	ast <u>5</u> hours 7 6 5 4 7 7 6 5 4 From Column 3 (Ho 1 From Column 2 (Ho	Power C Fac 3 2 J J ours) 2 Durs)	Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	
Duration = *Must be at lease 10 9 8 10 9 8 1 1 Time 0 Time 0 Time 0 1 2	ast <u>5</u> hours 7 6 5 4 1 1 $1From Column 3 (Ho1$ 1 $1From Column 2 (Ho1$ 1 1 1 13 4 5 6	Power C Fac 3 2 ours) 2 ours) 1 1 7 8	Correction Factor etor A 1.5 1 1.5 1 3 1	$\sum P_i x A_i x B_i = _$ i $0.7 0.5$ 4 4 5 4 $9.3 9.5$	
Duration = *Must be at lease 10 9 8 10 9 8 Time 10 9 8 10 9 8 Time 10 9 8 Time 10 9 8 1 1 1	ast 5 hours 7 6 5 4 1 1 $1From Column 3 (Ho1$ $1From Column 2 (Ho1$ 1 13 4 5 6	Power C 3 2 3 2 -1 1 ours) -2 -2 -1 1 -2 -1 1 -2 -1 1 -1 7 -1 8	Correction Factor etor A 1.5 1 1.5 1 3 1 3 1 3 1 9.0	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	0.3
Duration = *Must be at lease 10 9 8 10 9 8 Time 0 Time 0 1 2	ast 5 hours 7 6 5 4 7 7 6 5 4 From Column 3 (Ho 1 From Column 2 (Ho 3 4 5 6	Power C Fac 3 2 -1 1 ours) -2 ours) -1 1 7 8	Correction Factor etor A 1.5 1 1.5 1 3 1 3 1 9.0	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	
Duration = *Must be at lease 10 9 8 1 1 1 Time 0 Time 0 1 2	${2} + \frac{1}{2} + \frac{1}{$	Power C Fac 3 2 ours) 2 ours) 1 7 8 Fac	Correction Factor etor A 1.5 1 1.5 1 3 1 1 9.0 etor B	$\sum_{i} P_{i} x A_{i} x B_{i} = \{i}$ $0.7 0.5$ $4 - 4 - 4$ $4 - 5$ $4 - 5$ $9.3 9.5$	
Duration = *Must be at lease 10 9 8 Time 0 Time 0 1 2	$\frac{7}{1} + \frac{5}{1} + \frac{1}{1} + \frac{1}$	Power C Fac 3 2 J J ours) 2 J J 7 8 Fac	Correction Factor etor A 1.5 1 1.5 1 3 1 3 1 9.0 etor B =	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	0.3
Duration = *Must be at lease 10 9 8 Time 0 Time 0 1 2 Core Inventory	${}$ * ast <u>5</u> hours 7 6 5 4 From Column 3 (Ho $\frac{1}{1} \frac{1}{1}$ From Column 2 (Ho $\frac{1}{3} 4 5 6$ $y = 3.16E3 X _$	Power C Fac 3 2 J J ours) 	Correction Factor etor A 1.5 1 1.5 1 3 1 3 1 9.0 etor B =	$\sum P_i x A_i x B_i = _$ i $0.7 0.5$ $4 - 4$ $4 - 5$ $9.3 9.5$ ected Core Activ	0.3
Duration = *Must be at lease $10 \ 9 \ 8$ $10 \ 10 \ 9$ Time $10 \ 9 \ 10$ Time $10 \ 10 \ 10$	${}$ * ast <u>5</u> hours 7 6 5 4 From Column 3 (Ho $\frac{1}{1}$ From Column 2 (Ho $\frac{1}{3} 4 5 6$ $y = 3.16E3 X \I$	Power C Fac 3 2 ours) 1 1 7 8 Fac PCF, col 6 sum	Correction Factor etor A 1.5 1 1.5 1 3 1 3 1 3 1 9.0 etor B =	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	$- \frac{0.3}{ $
Duration = *Must be at less $10 \ 9 \ 8$ $10 \ 1 \ 2$ Core Inventory DATE:	${2} = \frac{3.16E3}{2} X $	Power C Fac 3 2 ours) 2 ours) 	Correction Factor etor A 1.5 1 1.5 1 3 1 3 1 3 1 9.0 etor B = Total Correction Factor	$\sum P_i x A_i x B_i = _$ i $0.7 0.5$ $4 - 4$ $4 - 5$ $9.3 9.5$ ected Core Activ	

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/18/2000		AI DETERMINATION	NS USING REACT	OK I O WER HISTORI	17 of 2
	// · · · · · · · · · · · · · · ·			<u></u>	Sheet 1
		DATA SI	IEET 14		
REACT	OR POWER HIS	STORY AND CO	ORE INVENTO	DRY DETERMIN	ATION
		NUCLIDE	: <u>Te 132</u>		
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Average	Duration	Shutdown	Factor	Factor	Product
Power	At Power	To End Of	Α	B	%PxAxB
Level		Power			
(% P)	(Hours)	(Hours)			
				ļ	
· · · ·					
·					
		I			
Duration = *Must be at le	* *	Power C Fac	Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = \underline{\qquad}$	
Duration = *Must be at le 10 9 8	* ast <u>310</u> hours 7 6 5 4	Power C Fac 3 2	Correction Factor tor A 1.5 1	$\sum_{i} P_{i} x A_{i} x B_{i} = \underline{\qquad}$	0.3
Duration = *Must be at le 10 9 8	ast <u>310</u> hours 7 6 5 4	Power C Fac 3 2 I I	torrection Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = \underline{\qquad}$	0.3
Duration = *Must be at le 10 9 8	$\frac{1}{2} + \frac{1}{2} + \frac{1}$	Power C Fac 3 2 1 1 urs)	Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = \underline{\qquad}$	0.3
Duration = *Must be at le 10 9 8 10 - 1 - 1 - 1 Time F	* ast 310 hours 7 6 5 4 1 1 1 1 1 1 1 1 1 1	Power C Fac 3 2 1 1 urs)	tor A 1.5 1	$\sum_{i} P_{i} x A_{i} x B_{i} = \underline{\qquad}$	 0.3
Duration = *Must be at le 10 9 8 11 1 Time F 0 Time F	* ast <u>310</u> hours 7 6 5 4 1 1 1 1 1 from Column 3 (Hou 1 1 1 1 100 rom Column 2 (Hou	Power C Fac 3 2 1 1 urs)	Correction Factor tor A 1.5 1 1 1 1 1 200	$\sum_{i} P_{i} x A_{i} x B_{i} = \{i}$ 0.7 0.5 1.1 0.7 0.5 0.5 0.7 0.5 0.5 0.7 0.5 0.7 0.5 0.5 0.7 0.5 0.5 0.7 0.5 0.5 0.7 0.5 0.5 0.5 0.5 0.7 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	0.3
L Duration = *Must be at le 10 9 8 10 9 8 10 1 1 Time Find Time Find L L L	* ast 310 hours 7 6 5 4 1 7 6 5 4 1 7 6 5 4 1 7 7 6 5 4 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Power C Fac 3 2 1 1 urs)	tor A 1.5 1 200	$\sum_{i} P_{i} x A_{i} x B_{i} = \{i}$ 0.7 0.5 0.7 0.5 0.7 0.5 0.7 0.5	
Duration = *Must be at le 10 9 8 10 9 8 11 1 1 Time F 0 1 1 1	* $\frac{310}{1} \text{ hours}$ 7 6 5 4 $\frac{1}{1}$ From Column 3 (Hours) 7 1 1 1 10(7) 7 1 1 1 10(7) 7 1 1 1 10(7) 7 1 1 1 10(7) 7 1 1 1 10(7) 7 1 1 1 10(7) 7 1 1 1 10(7) 7 1 1 1 10(7) 7 1 1 1 10(7) 7 1 1 1 1 1 10(7) 7 1 1 1 1 1 10(7) 7 1 1 1 1 1 10(7) 7 1 1 1 1 1 10(7) 7 1 1 1 1 1 1 10(7) 7 1 1 1 1 1 1 1 10(7) 7 1 1 1 1 1 1 1 10(7) 7 1 1 1 1 1 1 1 1 10(7) 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Power C Fac 3 2 Urs) Jurs)	Correction Factor tor A 1.5 1 1.5 1 1.	$\sum_{i} P_{i} x A_{i} x B_{i} = $	
Duration = *Must be at le 10 9 8 1 1 1 1 Time F 0 1 1 0 1 2	$ \begin{array}{c} $	Power C Fac 3 2 Urs) 1 1 1 1 7 8	tor A 1.5 1 1.5 1 200	$\sum_{i} P_{i} x A_{i} x B_{i} = $	0.3
Duration = *Must be at le 10 9 8 10 1 1 Time Fi 0 Time Fi 0 1 2	* ast <u>310</u> hours 7 6 5 4 + $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$	Power C Fac 3 2 urs) J J J J J J J J J J J J J	Correction Factor tor A 1.5 1 1.5 1 1.	$\sum_{i} P_{i} x A_{i} x B_{i} = \{i}$ $0.7 0.5$ $ $	0.3
Duration = *Must be at le 10 9 8 10 9 8 11 1 1 Time F 0 1 2	* ast 310 hours 7 6 5 4 7 6 5 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Power C Fac 3 2 1 1 urs) 1 1 7 8 Fac	tor A 1.5 1 1.5 1 200 1.5 1 9.0	$\sum_{i} P_{i} x A_{i} x B_{i} = $	0.3
Duration = *Must be at le 10 9 8 $10 10 9 8$ $10 10 10 10 10 10 10 10$	* ast <u>310</u> hours 7 6 5 4 + $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$	Power C Fac 3 2 urs) 7 8 Fac	Correction Factor tor A 1.5 1 1.5 1 200 9.0 tor B	$\sum_{i} P_{i} x A_{i} x B_{i} = $	0.3
Duration = *Must be at le 10 9 8 1 1 1 1 Time F 0 1 2 Core Inventor	y = 1.34E3 X	Power C Fac 3 2 1 1 urs) 1 1 7 8 Fac PCF col 6 sum	Forrection Factor tor A 1.5 1 1.5 1 1.	$\sum_{i} P_{i}xA_{i}xB_{i} = $	0.3
Duration = *Must be at le 10 9 8 1 1 1 1 Time F 1 1 1 0 1 2	y = 1.34E3 X	Power C Fac 3 2 1 1 urs) 1 1 7 8 Fac PCF, col 6 sum	Forrection Factor tor A 1.5 1 1.5	$\sum_{i} P_{i}xA_{i}xB_{i} = \{i}$ 0.7 0.5 1 0 0.7 0.5 1 0 0.7 0.5 1 0 0.7 0.5 1 0 0.7 0.5 1 0 0.7 0.5 1 0 0.7 0.5 1 0 0.7 0.5 1 0 0.7 0.5 1 0 0.7 0.5 1 0 0.7 0.5 1 0 0.7 0.5 1 0 0.7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.3

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proved By T. Gasser	Vog	tle Electric G	enerating P	lant 📐	Procedure Number 91504-C
te Approved 4/18/2000	CORE INVENTO	RY DETERMINATI	ONS USING REA	CTOR POWER HISTOR	Y Page Number 18 of
REACI	TOR POWER HI	DATA S	HEET 15	TORV DETERMIN	Sheet 1
		NUCLID	E: <u>Ba 140</u>		
Column 1 Average Power Level	Column 2 Duration At Power	Column 3 Shutdown To End Of Power	Column 4 Factor A	Column 5 Factor B	Column 6 Product %P x A x B
(% P)	(Hours)	(Hours)			
Duration =	*	Power (Correction Fact	tor $\sum_{i} P_i x A_i x B_i = $	
*Must be at le	ast <u>1230</u> hours	Fa	ctor A	1	
10 9 8 7	7654	3 2 I I	1.5 I	1 0.7 0	.5 0.3
Time From	Column 3 (Hours))]]			
l ₀ l Time From	l ₂₀₀ l l ₄₀₀ Column 2 (Hours	₆₀₀)	1 ₈₀₀ 1	1 ₁₀₀₀ I 1 ₁₂₀₀ I	I ₁₄₀₀
	$\begin{array}{c c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	- 7 8	I	9.0 9.3 9	$ \begin{bmatrix} 1 \\ 1 \end{bmatrix} $
	- •	Fa	ctor B		
Core Inventor	y = 1.63E4 X	PCF, col 6 sum	_= Total C	orrected Core Activi	Curies
DATE:	TIME	:]	PERFORMED	BY:	

Printed	May 3	, 2000 at	10:42

Approved By J.T. Gasser	Vog	tle Electric G	enerating Pla	nt 🔬	Procedure Number 91504-C
Date Approved 04/18/2000	CORE INVENTO	RY DETERMINATIO	ONS USING REACT	OR POWER HISTORY	Page Number 19 of 21
REAC	TOR POWER HIS	DATA SI STORY AND C	HEET 16 ORE INVENTO	ORY DETERMIN	Sheet 1 of
		NUCLIDI	E: <u>La 140</u>		
Column 1 Average Power Level	Column 2 Duration At Power	Column 3 Shutdown To End Of Power	Column 4 Factor A	Column 5 Factor B	Column 6 Product %P x A x B
(% P)	(Hours)	(Hours)			
Duration =	*	Power C	Correction Factor	$\sum_{i} P_{i} x A_{i} x B_{i} = _$	
With the at it	2031 <u>100</u> 10013	Fac	tor A		
10 9 8 7 	$\begin{array}{c c} 6 & 5 & 4 \\ \hline 1 & 1 & 1 \\ \hline Column 3 (Hours) \\ \hline 20 & 40 & 60 \\ \hline Column 2 (Hours) \\ \end{array}$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0.7 0.5 1 1 1 1 	0.3
	4 5 6	1 7 8	1 1 1 1 9.0	9.3 9.5	9.7
Core Inventor	y = 1.72E4 X	Fac	шг Б =		Curies
	I	PCF, col 6 sum	Total Corr	ected Core Activit	y
DATE	TIME	. т		7.	

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ł	Pr	inted	May	3,	2000	at	10:42

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T. Gasser te Approved	V Og CORE INVENTO	tle Electric Go Ry determination	ONS USING REACT	or power histor	91504-C RY Page Number
18/2000	,		· · · · · · · · · · · · · · · · · · ·	<u> </u>	Sheet 1
		DATA S	HEET 17		
REACTO	OR POWER HI	STORY AND C	ORE INVENTO	RY DETERMI	NATION
		NUCLIDI	E: <u>La 142</u>		· .
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Average	Duration	Shutdown	Factor	Factor	Product
Power	At Power	To End Of	A	В	%P x A x B
Level	1	Power			
(% P)	(Hours)	(Hours)			
······					
	<u> </u>]	[
Duration =	*	Power C	Correction Factor	$\sum P_i x A_i x B_i = $	
*Must he at lea	est 6 hours			i	
must be ut iou	st <u>o</u> nouis	Fac	tor A		
10 9 8 7	654	3 2	1.5 1	0.7 0.5	0.3
		- I - I		.	-
l ₀ Time From Co	I ₁ I I ₂ lumn 2 (Hours)	1 1 ₃ 1	4 1 5	1 1 ₆ 1	1 ₇ 1
<u>_</u>	<u></u>	<u> </u>		<u> </u>	
0 1 2 3	456	i i 7 [•] 8	i i 9.0	93 95	I 97
		· · ·			•
		Fac	tor B		
с. т	1 4077 4 37				
Core Inventory	= <u>1.43E4</u> X]	PCF, col 6 sum	_= Total Corr	rected Core Activ	Curies
					5
DATE:	TIME	: F	PERFORMED B	Y:	-

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pproved By .T. Gasser	Vog	tle Electric Ge	enerating Pla	nt 🔺	Procedure Number 1 91504-C
ate Approved 94/18/2000	CORE INVENTOR	LY DETERMINATIO	INS USING REACT	OR POWER HISTORY	7 Page Number 21 of 21
	A	DATA SI			Sheet 1 o
		DATA 51	IELI IO		
REACT	OR POWER HIS	STORY AND CO	JRE INVENTC)RY DETERMIN	ATION
		NUCLIDI	3: <u>Pr 144</u>		
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Average	Duration	Shutdown	Factor	Factor	Product
Power	At Power	To End Ot	A	В	%PxAxB
	(Hours)	(Hours)	<u> </u>	<u>+</u>	
(/01)		(Hours)	<u> </u>	+	
	++	ſ!			······
			Í		
		lJ	l	<u>}</u>	
			l	++-	
	++		l	+	
	++	· · · · · · · · · · · · · · · · · · ·	l	+	
			l	·	
	- -		• • •		
Duration =	·	Power C	orrection Factor	$\sum_{i} P_i x A_i x B_i = $	
*Must be at le	ast 1.5 hours			1	
	101 <u>110</u> me	Fac	tor A		
10 9 8	7654	3 2	1.5 1	0.7 0.5	0,3
			<u>1</u> L <u>1</u>	$\frac{1}{1} \frac{1}{1} \frac{1}$	╶┰╧──┰╾┨
	a Column 3 (Hours)				_ <u></u>
1 ₀ 1	0.2 I I _{0.4}	4 0.6	0.8	T I 1.0 I 1.2	T I.4
Time From	n Column 2 (Hours)			· · · ·	• • • •
			·····	- 	
		1 i 7 8	9.0	· <u>nn</u> og	9.7
	3 4 5 6	7 8	9.0	9.3 9.5	
$\begin{array}{c c} & & \\ \hline & & \\ 1 & 1 \\ 0 & 1 & 2 \end{array}$	3 4 5 6	7 · 8	9.0	9.3 9.5	
$\begin{array}{c c} & & & \\ \hline & & & \\ 0 & 1 & 2 \end{array}$	3 4 5 6	Factor	9.0 tor B) 9.3 9.5	
Core Inventory	= 1.15E4 X	7 8 Fac	9.(tor B =) 9.3 9.5	Curies
Core Inventory	$r = 1.15E4 X _{P}$	Fac	9.0 tor B _ = Total Corr	9.3 9.5	Curies v
Core Inventory	r = 1.15E4 X	7 8 Fac CF, col 6 sum	9.0 tor B _=	rected Core Activit	Curies y

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