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Revision 50 - Incorporated PCR 2223046 to remove affected process effluent ramonitors from the Technical Specifications and incorporate them into the Offsite Calculation Manual. (Author: T. Bertolini)					adiation Dose		
	Revision 49 - Incorporated PCR 2137189 per EC 278372 to update values in Methodology Section. (Author: T. Bertolini)						
	Revision 48 - Incorporated PCR 2184721 to add note to cover page ensuring that changes to the ODCM are reviewed by EP. (Author: N. Davidson)						
	Revision 47 - Incorpora (Author: N. Davidson)	ated PCR 2174317 t	o correct location on ma	p in the ARE	EOR.		
	Revision 46 - Incorpora _(Author: ⁻ N. Davidson)	ated PCR 2146572 t	o update procedure num	iber referend	e.		
	Revision 45 - Incorporated PCR 2067790 for addition of Unit 1 and 2 containment equipment hatch monitoring as potential effluent pathways-during outages. (Author: J. Hunt)						
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	50	W. Parks	09/07/17	STATUS	COMPLETED		
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-	INTRODUCTION			
The ODCM consists of the Controls Section followed by the Methodology Section.				
The Controls Section provides the Control Statements, Limits, ACTION Statements, Surveillance Requirements and BASES for ensuring that Radioactive Liquid and Gaseous				

Surveillance Requirements and BASES for ensuring that Radioactive Liquid and Gaseous Effluents released to UNRESTRICTED AREAS and/or the SITE BOUNDARY will be maintained within the requirements of 10 CFR Part 20, 40 CFR Part 190, 10 CFR Part 72, 10 CFR 50.36.a and 10 CFR Part 50 Appendix-I radioactive release criteria. All Control Statements and most Administrative Control Statements in the ODCM are directly tied to and reference the Plant Technical Specification (TS) Administrative Section. The Administrative Control for Major Changes to Radioactive Liquid, Gaseous and Solid Treatment Systems is as per the guidance of NUREG-1301, April 1991, Supplement No. 1 to NRC Generic Letter 89-01. The numbering sequences of Control Statements-also follow the guidance of NUREG-1301 as applicable, to minimize differences. Regulatory Guide 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment, 6.3.1 and 6.3.2, provide the background for the need to maintain Quality Assurance programs for effluent releases and radiological environmental monitoring.

The Methodology Section uses the models suggested by NUREG-0133, November, 1978 and Regulatory Guide 1.109 to provide calculation methods and parameters for determining results in compliance with the Controls Section of the ODCM. Simplifying assumptions have been applied where applicable to provide a more workable document for implementing the Control requirements. Alternate calculation methods may be used from those presented as long as the overall methodology does not change or as long as most up-to-date revisions of the Regulatory-Guide 1.109 dose conversion factors and environmental transfer factors are substituted for those currently included and used in this document.

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RECORDS AND NOTIFICATIONS

All records of reviews performed for changes to the ODCM shall be maintained in accordance with RM-AA-100-1000, Processing Quality Assurance Records. All ORG approved changes to the ODCM, with required documentation of the changes per TS 6.14, shall be submitted to the NRC in the Annual Effluent Release Report. Procedures that directly implement, administer or supplement the requirements of the ODCM Controls and Surveillances are:

- CY-SL-102=0104, Processing Aerated Liquid Waste
- CY-SL-102-0105, Processing Gaseous Wastes
- 0-CPP-28.20, Met Tower Data Processing
- COP=05:04, Chemistry Department Surveillances and Parameters
- CY-SL-104-0112; Determination of Process Radiation Monitor Setpoints
- The Radiological Environmental Monitoring Program is performed by the State of Florida as per FPL Juno Nuclear Plant Services Corporate Environmental Procedure Number EV-SR-104-1001.
- The licensee also performs environmental monitoring per EV-AA-01, Fleet Groundwater Protection Program, in order to meet the objectives of the Nuclear Energy Institute's Industry Initiative (NEI_07-07).

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1.0 DEFINITIONS_for CONTROLS-SECTION OF ODCM

The defined terms of this section appear in capitalized type and are applicable throughout these Controls.

<u>ACTION</u>

1.1 ACTION shall be that part of a Control that prescribes remedial measures required under designated conditions.

CHANNEL CALIBRATION

1.4 CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that-it responds with the necessary range and accuracy to known values of the parameter which the channel monitors. The CHANNEL CALIBRATION shall encompass the entire channel including the sensor and alarm and/or trip functions and shall include the CHANNEL FUNCTIONAL TEST. The CHANNEL CALIBRATION may be performed by any series of sequential, overlapping or total channel steps such that the entire channel is calibrated.

CHANNEL CHECK

1.5 CHANNEL CHECK shall be the qualitative assessment of channel behavior during operation by observation. This determination shall include, where possible, comparison of the channel indication and/or status with other indications and/or status derived from independent instrument channels measuring the same parameter.

CHANNEL FUNCTIONAL TEST

1-6 A CHANNEL FUNCTIONAL TEST shall be the injection of a simulated signal into the channel as close to the primary sensor as practicable to verify OPERABILITY including alarm and 7 or trip functions.

DOSE EQUIVALENT I-131

1.10 DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microCurie/gram) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be the thyroid dose conversion factors listed in Federal Guidance Report 11, Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion.

50 OFFSITE DOSE CALCULATION MANUAL (ODCM) 13 of 231 3ROCEDURE NO: ST. LUCIE PLANT 13 of 231 1.0 DEFINITIONS for CONTROLS SECTION OF ODCM (continued) 13 of 231 FREQUENCY NOTATION 11.1 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in-Table 1.1. 1.1 INDUSTRY INITIATIVE 11.1 Nuclear Energy Institute Initiative (NEI 07-07) on Managing Situations Involving Inadvertent Radiological Releases into Groundwater (The industry initiative has been adopted through FPL Nuclear Policy EV-AA-01, Fleet Groundwater Protection Program). MEMBER (S) OF THE PUBLIC 1.17 MEMBER OF THE PUBLIC means an individual in a controlled or unrestricted area. However, an individual is not a member of the public during any period in which the individual receives an occupational dose. 0FFSITE DOSE CALCULATION MANUAL 1.18 The OFFSITE DOSE CALCULATION MANUAL (DDCM) shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the conduct of the Environmental Radiological Monitoring Program. The ODCM shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by TS section 6.8.4 and (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Annual Radioactive Effluent. Reiease Reports required by TS 6.9.1.7 and 6.9.1.8. OPERABLE - OPERABILITY 1.1	REVISIO	DN NO.:	PROCEDURE TITLE:	PAGE
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C-200 ST. LUCIE PLANT 1.0 DEFINITIONS for CONTROLS SECTION OF ODCM (continued) FREQUENCY NOTATION 1.13 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in-Table 1.1. INDUSTRY INITIATIVE 1.14 Nuclear Energy Institute Initiative (NEI 07-07) on Managing Situations Involving Inadvertent Radiological Releases into Groundwater (The industry initiative has been adopted through FPL Nuclear Policy EV-AA-01, Fleet Groundwater Protection Program). MEMBER (S) OF THE PUBLIC 1.17 MEMBER OF THE PUBLIC means an individual in a controlled or unrestricted area. However, an individual is not a member of the public during any period in which the individual receives an occupational dose. OFFSITE DOSE CALCULATION MANUAL (ODCM) shall contain the methodology and parameters used in the calculation of fosaeous and liquid effluent monitoring Program. The ODCM shall also contain (1) the Radioactive graduations and Radiological Environmental Monitoring Programs required by TS section 6.8.4 and (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Annual Radioactive Effluent. Release Reports required by TS 6.9.1.7 and 6.9.1.8. OPERABLE - OPERABILITY 1.19 A system, train, component or device shall be OPERABLE or-have OPERABLE or or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their related support function(s). OPERATI	PROCE	DURE NO.:		13 01 231
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OPERATIONAL MODE - MODE	1.19	A system, su OPERABILIT all necessary water, lubrica subsystem, to of performing	bsystem, train, component or device shall be OPERAB Y when it is capable of performing its specified function attendant instrumentation, controls, electrical power, c ation or other auxiliary equipment that are required for the rain, component or device to perform its function(s) are their related support function(s).	LE or-have n(s) and when ooling or seal ne system, also capable
	OPER	RATIONAL MC	DE - MODE	

1.20 An OPERATIONAL MODE (i.e., MODE) shall correspond to any one inclusive combination of core reactivity condition, power level and average reactor coolant temperature specified in Table 1.2 of the St. Lucie Plant TS.

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ST. LUCIE PLANT

1.0 DEFINITIONS for CONTROLS SECTION OF ODCM (continued)

PURGE - PURGING

1.24 PURGE or PURGING shall be any controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity,_concentration or other operating condition, in such a manner that replacement air or gas is required to purify the confinement.

RATED THERMAL POWER

1.25 RATED THERMAL POWER shall be a total reactor core heat transfer rate to the reactor coolant of 3020 MWt.

REPORTABLE EVENT

1.27 A REPORTABLE EVENT shall be any of those conditions specified in Section 50.73 of 10⁻CFR Part 50.

SITE BOUNDARY

1.30 SITE BOUNDARY means that line beyond which the land or property is not owned, leased or otherwise controlled by the licensee.

SOURCE CHECK

1.31 A SOURCE CHECK shall be the qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.

THERMAL POWER

1.33 THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

UNPLANNED RELEASE

1.34 **UNPLANNED RELEASE** is the unintended discharge of a volume of liquid or airborne radioactivity to the environment. The following guidance is presented to classify differences between unplanned releases and other releases that are not considered as an **UNPLANNED RELEASE**:

Is an UNPLANNED RELEASE if:

1. The wrong waste gas decay tank or liquid radwaste release tank is released off site.

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1.0	DEFI	NITIONS	S for CONTROLS SECTION OF ODCM (continued)	
1.34	(conti	nued)		
	2.	Failure radioa at the discha	e of process system to automatically divert a process st ctive treatment system upon radioactivity being presen detection level or at a certain level of activity, and the r rge off site occurs.	tream to a t in the process esult is a
	3.	Large of radio 10 CFI	losses from unexpected pipe or valve leaks where the oactive material to off site such that a 10 CFR Part 50. R Part 50.73 report is required.	resulting loss 72 or
~	4.	For Ga 8 hour were d declare	as Decay Tank,-if a Gas Decay Tank loses greater than s for 9 consecutive shifts, or 18 psig in 72 hours, AND- letermined to be to the Reactor Auxiliary Building Atmo e the losses as an UNPLANNED RELEASE (reference	1 2 psig per the losses sphere, then CR 00-2039).
	is not	an UNF	PLANNED RELEASE if:	
	1.	lt cann part of	ot be shown that the release went off site, i.e., gas we the system(s) that contained the loss.	nt to another
	2.	Norma purging	Il losses through the Plant Vent due to val ve and pipe I g activities to make the system safe for mainten a nce a	eakage and ctivities.
UNRI	ESTRIC	CTED A	REA	
1.35	UNRE contro	ESTRIC	TED AREA means an area, access to which is neither the licensee.	limited nor
VENT	<u> </u>	<u>ON EXH</u>	AUST TREATMENT SYSTEM	
1.39	A VE and in form i absor from f syste Safet VENT	NTILATI in efflue bers an the gase m-is not y Featur FILATIO	ION EXHAUST TREATMENT SYSTEM shall be any sy to-reduce gaseous radioiodine or radioactive material ints by passing ventilation or vent exhaust-gases throug d/or HEPA filters for the purpose of removing iodines of eous exhaust stream prior to the release to the environ considered to have any effect on noble gas effluents. res Atmospheric Cleanup Systems are not considered N EXHAUST TREATMENT SYSTEM components.	ystem designed in particulate gh charcoal or particulates ment. Such a Engineered to be

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1.0 DEFINITIONS for CONTROLS SECTION OF ODCM (continued)

<u>VENTING</u>

1.40 VENTING shall be the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is not provided or required during VENTING. Vent, used in system names, does not imply a VENTING process.

WAS∓E GAS HOLDUP SYSTEM

1.41 A WASTE GAS HOLDUP SYSTEM shall be any system designed and installed to reduce radioactive gaseous effluents by collecting Reactor Coolant System offgases from the Reactor Coolant System and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

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	TABLE 1.1 <u>FREQUENCY NOTATION</u> (Page 1_of 1)
NOTATION	FREQUENCY
S	At least once per 12 hours.
D	At least once per 24 hours.
V۷	At least once_per 7 days.
4/M*	At least 4 per month at intervals of no greater than 9 days and minimum of 48 per year.
M	At least once per 31 days.
Q	At lease once per 92 days.
SA	At least once per 184 days.
R	At least once per 18 months.
S/U	Prior to each reactor startup.
N.A.	Not Applicable.
P**	Completed prior to each release
1/DSC	Once per Dry Shielded Canister (DSC) loading and unloading operation when DSC is in the Cask Handling Facility (CHF) and DSC is loaded with Spent Fuel.

- * For Radioactive Effluent Sampling
 ** For Radioactive Batch Releases Only

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3/4	CONTROLS	AND SURVEILLANCE_REQUIREMENTS	
3/4.0_	APPL	ICABILITY	
CONT	ROLS		
3.0.1	Compliance during the co Control, the	with the Controls contained in the succeeding controls i onditions specified therein; except that upon failure to m associated ACTION requirements shall be met.	s required eet the
3.0.2	Noncompliar associated A the Control is of the ACTIC	nce with a Control shall exist when the requirements of the CTION requirements are not met within the specified time restored prior to expiration of the specified time intervation of requirements is not required.	the Control and- me intervals. If als, completion
SURV	EILLANCE R	EQUIREMENTS	
4.0.1	Surveillance individual Co Requiremen	Requirements shall be met during the conditions specif ontrols unless otherwise stated in an individual Surveilla t.	ied for nce
4.0.2	Each Survei	lance Requirement shall-be performed within-the specif	ied time
	a. A max interv	kimum allowable extension not to exceed 25% of the su al.	rveillance
			-
-			

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PROCEDL	IRE NO.:		
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INSTR	UMENTATIO	N	
RADIO	ACTIVE LIQ	UID EFFLUENT MONITORING INSTRUMENTATION	
	ROLS		
3.3. 3 .9	In accorda monitoring OPERAB Control 3. shall be d paramete	ance with St. Lucie Plant_TS 6.8.4.f.1), the radioactive lid g instrumentation channels shown in Table 3.3-12 shall LE with their Alarm/Trip Setpoints set to ensure that the 11.1.1 are not exceeded. The Alarm/Trip Setpoints of the etermined and adjusted in accordance with the methodo rs in the OFFSITE DOSE CALCULATION MANUAL (OF	quid effluent be limits of nese channels blogy and DCM).
APPLIC	CABILITY:	At all times.	
ACTIO	<u>N:</u>		
a.	With a radioa Setpoint less suspend the channel or de acceptably co	ctive liquid effluent monitoring instrumentation channel conservative than required by the above control, immed release of radioactive liquid effluents monitored by the a eclare the channel inoperable or change the setpoint so onservative.	Alarm/Trip liately iffected it is
b.	With less tha instrumentati Restore the i unsuccessful this inoperab	n the minimum number of radioactive liquid effluent mor on channels OPERABLE, take the ACTION shown in Ta noperable instrumentation to OPERABLE status-within 3 , explain in the next Annual Radioactive Effluent Releas ility was not corrected in a timely manner.	hitoring able 3.3-12. 30 days and, if e Report why
c. F	Report all⁻dev	iations₋in the Annual Radioactive Effluent Release Repo	ort.
SURVE		EQUIREMENTS	
4.3.3.9	Each radi demonstr SOURCE TEST at t	oactive liquid effluent monitoring instrumentation channe ated OPERABLE by performance of the CHANNEL CHI CHECK, CHANNEL CALIBRATION and CHANNEL FU he frequencies shown in Table 4.3-8.	el shall be ECK, INCTIONAL
	SOURCE TEST at t	CHECK, CHANNEL CALIBRATION and CHANNEL FU he frequencies shown in Table 4.3-8.	INC FIONAL

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	RADIOAC	TABLE 3.3-12 TIVE LIQUID EFFLUENT MONIT (Page 1 of 2)	DRING INSTRUMENT	<u>ATION</u>
	<u> </u>	INSTRUMENT	MINIMUM CHANNELS OPERABLE	ACTION
1	Radioactivity Mo Termination of R	nitors Providing Alarm and Automatic elease		
i	a) Liquid Radv	vaste Effluent Line	1	35
	b) Steam Gen	erator Blowdown Effluent Line	1/SG	36, 37
2	. Flow Rate Meas	urement Devices_		
	a) ⁻ Liquid Radv	vaste Effluent Line	N.A	38
	b) Discharge (Canal	N.A	38
	c) Steam Gen	erator Blowdown Effluent Lines	N.A	38

SG - Denotes Steam Generator

ACTION STATEMENTS

ACTION 35 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases may continue provided that prior to initiating a release:-

a. At least two independent samples are analyzed in accordance with the Surveillance Requirement for concentration limit of Control 4.11.1.1.

AND

b. At least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge line valving.

Otherwise, suspend release of radioactive effluents via-this pathway.

ACTION 36 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided grab samples are analyzed for gross radioactivity (beta or gamma) at a limit of detection of at least 2.E-07 micro-Curie/ml:

a. At least once per 8 hours⁽¹⁾ when the specific activity of the secondary coolant is greater than 0.01 micro-Curies/gram DOSE EQUIVALENT I-131

OR

b. At least once per 24 hours⁽¹⁾ when the specific activity of the secondary coolant is less than or equal to 0.01 micro-Curies/gram DOSE EQUIVALENT I-131.

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		TABLE 3.3-12	
	RADIOAC	TIVE LIQUID EFFLUENT MONITORING INSTRUMEN (Page 2 of 2)	TATION
		ACTION STATEMENTS (continued)	
	ON 27 \### +	the number of channels ODEDADLE lage then required	av the
Minir and a to ac 5 gal prese	num Channels analyzed at a L hieve detectior lons per day, p ent.	OPERABLE requirement, isotopic grab samples shall b ower Limit of Detection for I-131, Co-58, Co-60, Cs-134 n sensitivity capable of detecting a primary-to-secondary provided that the Reactor Coolant System has sufficient	e obtained , and Cs-137 leak rate of activity
The a	applicable freq	uency shall-be:	
In-M(DDES 1, 2, 3, 4	4	
a.	At least once provided that	e per day ⁽¹⁾ for isotopic activity on the affected Steam Ge t the Air Ejector Gas Activity Monitor is OPERABLE,	enerator,
		OR	
b.	At least ever Air Ejector G	y 8 hours ⁽¹⁾ for isotopic activity on the affected Steam G as Activity Monitor is INOPERABLE.	enerator, if the
This (TR-∶	requirement is 104788-R2) pe	intended to meet EPRI PWR Primary-to-Secondary Lea r reference PMAI 00-08-109.	ak Guidelines
ACT ECL ECL	ION 38 - Minim calculations fo calculations fo	num system design flow of required running_pumps shall r discharge canal flow and maximum system design flow r effluent line flow.	be utilized fo v be utilized fo
TABI	<u>E 3.3-12 Nota</u>	tion	
(1) -	The initial sa Subsequent per ODCM s to exceed 25	mple shall be completed prior to the frequency interval s samples (of the same INOPERABLE condition) may be urveillance requirement 4.0.2 (a maximum allowable ex 5% of the surveillance-interval).	specified. performed tension not
]			

		- NO					AGE.
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		0-200					
			TAE	BLE 4 . 3-8			
		RADIOAC			DRING IN	STRUMENTA	ATION
-			SURVEILLANCE	REQUIRE	MENIS	(4)	
-				ge i oi i)			
-		-1N3	STRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNE FUNCTION TEST
1.	Rac Aut	dioactivity Mor omatic Termir	nitors Providing Alarm and nation of Release				
ŀ	a)	Liquid Radw	aste Effluent Line	D	P	- R⁻(2)	Q (1)
-	b)	Steam Gene Line	erator Blowdown Effluent	D	м	R (2)	Q (1)
2.	Elo	w Rate Meası	Irement Devices				
	a)	Liquid Radw	vaste Effluent Line	D (3)	N.A.	R	- Q
	b)	⁻ Discharge C	anal-	D (3)	N.A.	R	Q
	c)	Steam Gene Line	erator Blowdown Effluent	D (3)	N.A.	R	Q
			TABLE	NOTATIO	<u>NS</u>		
(1)	-	The CHANN pathway and	TABLE EL FUNCTIONAL TEST sh control room alarm annunc	NOTATIOI all also dem ciation occu	<u>NS</u> nonstrate a r if≓any of t	automatic isolat the following co	tion of this onditions ex
(1)	-	The CHANN pathway and 1. Instru	TABLE EL FUNCTIONAL TEST sh control room alarm annund ment indicates measured h	NOTATIOI all also dem ciation occu evels above	NS nonstrate a r if∹any of f e the alarm	automatic isolat the following co /trip setpoint or	tion of this onditions ex r
(1)	-	The CHANN pathway and 1. Instru 2. Circu	TABLE EL FUNCTIONAL TEST sh control room alarm annund ment indicates measured h it failure or	NOTATIOI all also dem ciation occur evels above	NS nonstrate a r if∹any of t e the alarm	automatic isolat the following co /trip setpoint or	tion of this onditions ex r
(1)	-	The CHANN pathway and 1. Instru 2. Circu 3. Instru	TABLE EL FUNCTIONAL TEST sh control room alarm annund iment indicates measured h it failure or iment indicates a downscal	NOTATIOI all also dem ciation occur evels above e failure or	NS nonstrate a r if=any of f e the alarm	automatic isolat the following co /trip setpoint or	tion of this onditions ex r
(1)	-	The CHANN pathway and 1. Instru 2. Circu 3. Instru 4. Instru	TABLE EL FUNCTIONAL TEST sh control room alarm annund iment indicates measured h it failure or iment indicates a downscal iment controls not set in op	NOTATIOI all also dem ciation occur evels above e failure or erate mode	NS nonstrate a r if=any of t e the alarm	automatic isolat the following co /trip setpoint of	tion of this onditions ex r
(1)	- - - - - - - - - - - - - - - - - -	The CHANNI pathway and 1. Instru 2. Circu 3. Instru 4. Instru The initial Ch reference sta or using stan These standa and rate cap CALIBRATIC used.	TABLE EL FUNCTIONAL TEST sh control room alarm annund ment indicates measured h it failure or ment indicates a downscal ment controls not set in op ANNEL CALIBRATION sh andards traceable to the Na dards that have been calib ards should permit calibrati abilities that are typical of n DN, button sources that have	NOTATION all also dem ciation occur evels above e failure or erate mode all be perfor tional Institu rated agains ng the syste ormal plant re-been rela	NS nonstrate a r if=any of t e the alarm the alarm the alarm st standard em over its operation ted to the	automatic isolat the following co /trip setpoint of /trip setpoint of dards & Techn ds certified by t intended rang For subseque initial calibratio	tion of this onditions ex r of the ology (NIST he-NIST. e of energy ent CHANN on may be
(1)		The CHANNI pathway and 1. Instru 2. Circu 3. Instru 4. Instru The initial Ch reference stand and rate cap CALIBRATIC used. CHANNEL C CHANNEL C continuous, p	TABLE EL FUNCTIONAL TEST sh control room alarm annund ument indicates measured le it failure or ument indicates a downscal ument controls not set in op HANNEL CALIBRATION sh andards traceable to the Na dards that have been calib ards should permit calibrati abilities that are typical of n DN, button sources that hav CHECK shall consist of verific HECK shall consist of verific HECK shall be made at lead periodic or batch releases a	NOTATION all also dem ciation occur evels above e failure or erate mode all be perfor tional Institu rated agains ng the syste ormal plant re-been rela ying indicati ast once per are made.	NS nonstrate a r if=any of f e the alarm the alarm the alarm st standard operation ted to the ion of flow 24 hours	automatic isolat the following co /trip setpoint of /trip setpoint of dards & Techn is certified by t intended rang For subseque initial calibratio during periods on days on wh	tion of this onditions ex r of the hology (NIST he-NIST. e of energy ent CHANN n may be s of release. ich

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INSTRUM	<u>/IENTATIO</u>	<u>N</u> -	
RADIOAC	CTIVE GAS	SEOUS EFFLUENT MONITORING INSTRUMENTATIO	<u>DN</u>
	DLS		
3.3.3.10 ⁻ -	In accorda effluent m OPERABI Control 3. shall be de parameter	ance with St. Lucie-Plant TS 6.8.4.f.1), the radioactive g onitoring instrumentation channels shown in ∓able 3.3- LE with their Alarm/Trip Setpoints set to ensure that the 11.2.1.are not exceeded. The Alarm/Trip Setpoints of t etermined and adjusted in accordance with the method rs in the ODCM.	aseous 13 shall be limits of hese channels ology and
APPLICA	BILITY:	As shown in Table 3.3-13	
ACTION:			-
a. Wi Se su ch ac	th a radioa tpoint less spend the annel or de ceptably co	ctive gaseous effluent monitoring instrumentation chan conservative than required by the above control, imme release of radioactive gaseous effluents monitored by t eclare the channel inoperable or change the setpoint so onservative.	nel Alarm/Trip diately he affected it is
b. Wi ins Re un thi	th less that strumentations store the in successful s inoperable	n the minimum number of radioactive gaseous effluent on channels OPERABLE, take the ACTION_shown in T noperable instrumentation to OPERABLE status within , explain in the-next Annual Radioactive Effluent Releas ility was not corrected in a timely manner.	monitoring able 3.3₌13 30 days-and, if se Report wh <u>y</u>
c. Re	port all dev	viations in the Annual Radioactive Effluent Release Rep	port.
SURVEIL	LANCE R	EQUIREMENTS	
4.3.3.10	Each radio demonstra SOURCE TEST at t	oactive gaseous effluent monitoring instrumentation chated OPERABLE by performance of the CHANNEL CH CHECK, CHANNEL CALIBRATION and CHANNEL FU he frequencies shown in Table 4.3-9.	annel shall be ECK, JNCTIONAL

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RADIOACTI	T VE GASEOUS EFFI	ABLE 3.3-13	NG INSTRU	MENTATION		
	(Page 1 of 4)				
INSTRUMEN	MINIMUM T CHANNELS OPERABLE	APPLICABILITY	ACTION	MEASUREMENT RANGE		
1. Waste Gas Hol	dup					
a) Noble Gas Monitor - Providing A and Autom Terminatio Release	Activity Alarm atic 1/ Rx n of	*	45			
2. Condenser Evacuation Sy	stem					
a) Noble Gas Activ Monitor	^{vity} 1/ Rx	**	47			
2 Diant Mant Car		Modes 1, 2, 3, 4	48			
a) Noble Gas Activ Monitor (Lo Range)	rity pw 1/ Rx	***	47	10 ⁻⁷ – 10 ⁵ uCi/cc (Unit 1) 10 ⁻⁷ – 10 ⁻² uCi/cc (Unit 2)		
b) Noble Gas Activ Monitor (H Range)	rity igh 1/ Rx	***	47	10 ⁻² – 10 ⁵ uCi/cc (Unit 2)		
c) Iodine Sampler	1/ Rx	*	51			
d) Particulate-Sam	pler 1/ Rx		51			
 Flow Rate Moni Sampler Flow F Monitor 	tor N.A. (3) Rate 1/ Rx	*	46			
4. Fuel Storage A	rea					
a) Noble Gas Activ Monitor	rity 1/ Rx	*	-47,54	10 ⁻⁷ – 10 ⁵ uCi/cc (Unit 1)- 10 ⁻⁷ – 10 ⁵ uCi/cc (Unit 2)		
b) Iodine Sampler	- 1/ Rx	*	51			
c) Particulate Sam	pler 1/ Rx	*	51,54	1-10 ⁶ cpm		
d) Flow Rate-Moni e) Sampler Flow F	tor N.A. (3) Rate 1/ Rx	*	46			

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RADIOACTI	VE GAS	TAE SEOUS EFFLU (Pa	BLE 3.3-13 ENT MONITORIN age 2 of 4)	IG INSTRU	MENTATION	
INSTRUMEN	T	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION	MEASUREMENT RANGE	
5. Steam Generat Blowdown Buil Vent	or ding	-				
a) Noble Gas Activ Monitor (Lo Range)	ity w	1	***	47	10 ⁻⁷ – 10 ⁻² uCi/cc	
b) Iodine Sampler		1	*	51		
c) Particulate Sam	pler	1	*	51		
d) Flow Rate Monit	or -	N.A. (3)	*	53		
e) Sampler Flow R Monitor	ate-	1.	*	46		
6. Steam Safety Va Discharge	lve #	[−] 1/Steam Header	Modes 1,2,3,4	- 55	10 ⁻¹ – 10 ³ uCi/cc	
7. Atmospheric Ste Dump Valv Discharge	eam /e #	1/Steam Header	Modes 1,2,3,4	55	10 ⁻¹ 10 ³ uCi/cc	
8. ECCS Exhaust		1/Train	Modes 1,2,3,4	55	10 ⁻⁷ – 10 ⁵ uCi/cc	

* - At all-times while making releases via this pathway

** - At all times when air ejector exhaust is not directed to plant vent.

*** - At all times-while making releases via this pathway or modes 1-4

 # - On Unit 2, The steam safety valve discharge monitor and the atmospheric steam dump valve discharge monitor are the same monitor.

Rx - Denotes reactor

ACTION STATEMENTS

ACTION 45 - With-the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, the contents of the tank(s) may be released to the environment provided that prior to initiating a release:

a. At least two independent samples of the tank's contents are analyzed and

b. At least two technically qualified members of the facility staff independently verify the release rate calculations and discharge valve lineup.

Otherwise, suspend release of radioactive effluents via this pathway.

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RADIOACTI	TABLE 3.3-13 VE GASEOUS EFFLUENT MONITORING INSTRUMENTATION (Page 3 of 4)	
	ACTION STATEMENTS (continued)	ĺ
ACTION 46 - With the Channels OPERABLE flow rate is estimated	e number of channels OPERABLE less than required by the Minimum E requirement, effluent releases via this pathway may continue provided the at least once per 4 hours.	ř.
ACTION 47 - With the Channels OPERABLE	e number of channels OPERABLE less than required by the Minimum E, effluent releases via this pathway_may continue provided:	-
a. <u>If</u> channel inopera	ability is due to loss of Control Room alarm annunciation ONLY.	
- • Chann indicati	el checks are performed once per four hours ⁽¹⁾ to verify normal tion-and current assigned setpoints are NOT exceeded.	
	OR	
Grab s analyze	samples are taken at least once per 8 hours ⁽¹⁾ and these samples are ed for isotopic activity within 24 hours.	Ì
b. <u>If</u> channel inop	perability is due to loss of activity indication, <u>Then</u>	
• Grab s analyza	samples are taken at least once per 8 hours ⁽¹⁾ and these samples are red for isotopic activity within 24 hours.	
	OR⁻	ļ
• The eff that me	fluent pathway is continuously monitored using an effluent radiation monitor eets all the requirements in Table 4.3-9 and Table 4.11-2.	_
[• [[<u>If</u> -control room alarm annunciation is not available, <u>Then</u> channel checks are performed once per four hours ⁽¹⁾ to verify normal indication and current assigned setpoints are NOT exceeded.	_
ACTION 48 - With the Channels OPERABLE analyzed at a Lower L detection sensitivity ca provided that the Rea	e number of channels OPERABLE less than required by the Minimum E-requirement, noble gas isotopic grab samples shall be obtained and Limit-of Detection for Ar-41, Kr-88, Xe-133, Xe-133m, and Xe-135 to achieve capable of detecting a primary-to-secondary leak rate of 5 gallons per day, actor Coolant System has sufficient activity present.	

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· · · · · · · · · · · · · · · · · · ·	RADIOACT	TABLE 3.3-13 VE GASEOUS EFFLUENT MONITORING INSTRUME (Page 4 of 4)	<u>NTATION</u>
		ACTION STATEMENTS (continued)	ĥ
ACTIC	N-48 (continue	ed)	
The ap	oplicable freque	ency shall be:	
a.	At least once provided that	per 12-hours ^{(1);(2)} for noble gas isotopic activity on the Air Eje <u>each</u> affected Unit's Steam-Generator Blowdown Monitor is (ctor Exhaust OPERABLE,
		OR	
b.	At least once <u>either</u> of the a	per 8 hours ^{(1),(2)} for noble gas isotopic activi <u>t</u> y on the Air Ejec ffected Unit's Steam Generator Blowdown Monitors is INOPI	tor Exhaust if ERABLE.
This re (TR-10 Ejecto	equirement is ir 04788-R2), the r Exhaust while	ntended to meet EPRI PWR Primary-to-Secondary Leak Guid refore grab samples shall be taken regardless of the Alignme e in Modes 1, 2, 3, 4. (Reference PMAI 00-08-109.)	delines
ACTIC Chann provid 4.11-2	DN 51 - With the nels OPERABL ed samples are	e number of channels OPERABLE less than required by the E requirement, effluent releases via the affected pathway ma e continuously collected with auxiliary sampling equipment as	Minimum ly continue s required in Table
ACTIC releas	DN 53 - Maximu e monitor alarn	um system flows shall be utilized in the determination of the i n setpoint.	nstantaneous
ACTIC Chanr irradia irradia	DN 54 - With the nels OPERABL ted fuel within ted fuel assem	e number of channels OPERABLE less than required by the E requirement, suspend all-operations involving movement o the spent fuel storage pool or crane operations with loads ov blies in the spent fuel storage pool.	Minimum f recently er recently
ACTIC Chanr within param	DNS 55 - With t nels OPERABL 72 hours, or in neter(s).	he number of channels OPERABLE less than required by the E requirement, either restore the inoperable Channel(s) to O itiate the preplanned alternate method of monitoring the app	e Minimum PERABLE status opriate
TABLE	<u> = 3.13-13 NOT</u>	ATION	
(1) -	The initial sar samples (of th requirement 4 surveillance.in	nple shall be completed prior to the frequency interval specifine same INOPERABLE condition) may be performed per OD 0.0.2 (a maximum allowable extension not to exceed 25 percenterval).	ed. Subsequent CM surveillance ent of the
(2) -	If there is no s sample may b reverified onc established.	steam flow to the air ejector nozzles while the Reactor is in M be omitted, but the steam flow condition (status) to the air eje e per 8 hours to initiate grab samples if steam flow to the air	lode 4, <u>Then</u> the ctor shall be ejector nozzles is
(3) -	The flow rate documents ar	monitors are not functional. Vent flow is based on design er nd values in the UFSAR. EPIP-14 contains the correct flow v	ngineering values.
1			

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RA	DIOACTIVE	TAI E EFFLUE! (Pa	BLE 3.3-14 NT MONITOR age 1 of 4)	SETPOINT BAS	<u>SIS</u>
ODCM Effluent Gas	channels				HIGH SETPOINT [®]
1PV LOW RANGE GAS	S	RSC26_1L	- C-200 ^a	5 x Bkg. ^q	Allotted % Of Site
1FHB LOW RANGE G	4S	RSC26_4L	C-200ª	5 x Bkg. ^q	Allotted % Of Site
2A PV PIG LOW RANG	SE GAS	423	C-200 ^ª	5 x Bkg. ^q	Allotted % Of-Site
2B PV PIG LOW RANG	GAS	433	C-200ª	5 x Bkg.	Limit ⁹ For Plant Vent #2
2FHB LOW RANGE G/	4S-	413	C-200 ^a	5 x Bkg.	Allotted % Of Site _ Limit ^{9_}
SGBDB LOW RANGE	GAS ·	- 45-6	C-200 ^a	5 x Bkg.	Allotted % Of Site Limit ⁹
1 CONDENSER AIR E	JECTOR	35	C-200	2 x Bkg. ^b	3 x Bkg.
2 CONDENSER AIR E	JECTOR	403	C-200	2 x Bkg. ^b	3 x Bkg.
1 BATCH GAS EFFLU	ENT	42	C-200 ^a	As Per CY-SL-102-0105	As Per CY-SL-102-0105 ^{a,h}
2 BATCH GAS EFFLUENT		203	C-200 ^a	As Per CY-SL-102-0105	As Per CY-SL-102-0105 ^{a,h}
<u>2PV WRGM</u> Low Range Gas Mid Range Gas High Range Gas	<u>Chan</u> 621 622 623	624 ^P	C-200ª	-5-x Bkg. ^P uCi/sec	Allotted % Of Site Limit ^P uCi/sec
<u>2A ECCS WRGM</u> Low Range Gas Mid Range Gas High Range Gas	<u>Chan</u> 601 602 603	604 ^P	C-200ª	0.75 x High ^P uCi/sec	Allotted % Of Site Limit ^P uCi/sec
<u>2B ECCS WRGM</u> Low Range Gas Mid Range Gas High Range Gas	<u>Chan</u> 611₋ 612 613	614 ^P	C-200ª	0.75 x High ^P uCi/sec	Allotted % Of Site Limit ^P uCī/sec
ODCM Related Particul	late Channels	CHANNEL	BASIS DOCUMENT	ALERT SETPOINT ^e	HIGH SETPOINT ^{e-}
1FHB PARTICULATE		RSC26_4P	FUSAR & TS ^d	5000 CPM	10,000 CPM ^c
2A PV PIG PARTICULAT	E	421	FUSAR	5000 CPM	10,000 CPM ^c
2B PV PIG PARTICULAT	Έ	431	FUSAR	5000 CPM	10,000 CPM ^c
2FHB PARTICULATE		411	FUSAR & TS ^d	5000 CPM	10,000 CPM ^c
SGBDB PARTICULATE		45-4	FUSAR	5000 CPM	10,000 CPM ^c

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ODCM Related Iodine Channels	CHANNEL ID	BASIS DOCUMENT	ALERT SETPOINT [®]	HIGH SETPOINT [®]
2A PV PIG IODINE	422	FUSAR	5000 CPM	10,000 CPM ^c
2B PV PIG IODINE	432	FUSAR	5000 CPM	10,000_CPM ^c
2FHB IODINE	412	FUSAR	5000 CPM	10,000 CPM ^c
SGBDB ICDINE	45-5	FUSAR	5000 CPM	10,000 CPM ^c
ODCM Related Liquid Channels	CHANNEL ID	BASIS DOCUMENT	ALERT SETPOINT [®]	HIGH SETPOINT [®]
1A S/G BLOWDOWN	44	C-200	2 x Bkg.	2.E-04 uCi/ml ^{f,m}
1B S/G BLOWDOWN	45-	C-200	2 x Bkg.	2.E-04 uCi/ml ^{f,m}
2A S/G BLOWDOWN	121	C-200	2 x Bkg.	2.E-04 uCi/ml ^m
2B S/G BLOWDOWN	122	C=200	2 x Bkg.	2.E-04 uCi/ml ^m
1 BATCH LIQUID EFFLUENT	R6627	C-200	As Per CY-SL-102- 0104	As Per CY-SL-102- 0104 ⁿ
2 BATCH LIQUID EFFLUENT	301	C-200	As Per CY-SL-102- 0104	As Per CY-SL-102- 0104 ⁿ

Monitor channels not listed are covered per CY-SL-104-0112, Determination of Process Radiation_Monitor Setpoints

TABLE NOTATIONS

- a ODCM Control 3.11.2.1a
- b ODCM Table 4.11-1 Note (7)
- c ODCM Control 3.11.2.1.b
- d TS Table 3.3-6 required instrument 2.a.ii with setpoint per-ODCM
- e Setpoints may be rounded for analog and digital display input limitations.
- f The channel setpoint to be in cpm equivalent to this activity
- g per ODCM Methodology Step 2.2.2
- Batch Gaseous Release Rate and Maximum activity limits shall be used such that Plant Vent (PV) Release HIGH setpoints should not be exceeded.
- i, j, k, and I not used in notation for clarity

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RAI	TABLE 3.3-14 DIOACTIVE EFFLUENT MONITOR SETPOINT BASIS (Page 3 of 4)					
TABLE NOTATIONS	<u>S</u> (continued)-					
m - Continuous Liqi	uid setpoint methodology per ODCM 1.3.2					
n - Batch liquid set	point methodology per ODCM 1.3.1	=;				
o - Note "oscar" is	not used in this table notation					
p - The individual	Channel 621, 622 and 623 (Plant Vent No. 2)					
	Channel 601, 602 and 603 (ECCS 2A)	-				
and	Channel 611, 612 and 613 (ECCS 2B)					
Room Alarm. Only the Skid's Effluent Channel Setpoint provides an alarm function. After the first Alert and High Effluent Channel Alarms are received they will stay locked in if the release is increasing to higher activity levels. Transfer of Skid internal control to Effluent Channel input from the Mid or High Range Gas Channels will not reset an alarm, nor provide additional alarms. The Effluent Channel on the respective Skid has to be reset to new Setpoints by I&C. References to "Alert Alarm" and "High Alarm" settings for the Low Mid and High Channels are for display information only. This is why Table 3.3-14 only list Channel 624, 604 and 614 as the Channel-ID for Alarm Setpoints. These are the respective Skid's Alarm Channel.						
Channel ID for Alarm Setpoints. These are the respective Skid's Alarm Channel. Channel ID number 604 and 614-are the uCi/sec indication and ALERT/HIGH Alarm channels for ECCS 2A and ECCS 2B respectively. The ECCS exhaust pathways each have a single fan. Their Skid's Monitor Item #059 will be set per the measured ft3/minute exhaust rate. Their Skid's Monitor Item #060 (Accident Flow rate) will be set to zero since there is only one flow rate possible for these ECCS pathways. The uCi/sec value indicated on ECCS skids should be valid regardless of Normal or Accident conditions.						
The Channel II the uCi/sec and by) to the Low Vent 2's skid M could occur und is dependent w	O number 624 (generically called the Plant Vent 2 Skid d Control Room active ALERT/HIGH Alarm that is Com (621), Mid (622), and High (623) Range Gas Channels Ionitor Item #059 will be set for the maximum ft3/minute der all circumstances. The Plant Vent 2 Channel 624's that is set in Monitor Item #059 and Monitor Item #060	s Channel 4) is- mon (shared . The Plant e flow rate that actual uCi/sec as follows:				

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TABLE NOTATIONS	<u>S</u> (continued)
p (continued)	
The NORMAL -ALERT/High Al CY-SL-104-011 the Low Range process ft3/min	value for the Common Channel 624 uCi/sec indication and larms should be based on the equivalent uCi/sec of the 5 x Bkg (use 12, Determination of Process Radiation Monitor Setpoints) uCi/cc of channel #621 and RIM 26-90 Monitor Item #059 (the MAXIMUM nute flow rate that could occur in the Unit 2 Plant Vent.
The ACCIDEN switching (at a display a uCi/se -Range Channe Item #060 6,60 Radiation Moni Injection seque	T value for the Common Channel 624's uCi/sec is based on the Skid preset activity value)_input from the Low Range Channel to calculate / ec value based on receiving activity uCi/cc input from either the Mid el 622 (OR from the High Range Channel 623) and RIM 26-90 Monitor 00 ft3/minute (use CY-SL-104-0112, Determination of Process itor Setpoints) flow rate that is expected during a LOCA Safety ence.
During an ACC 2-HVE-6B, 2-H 2-HVE-10B to o flow rate that sl new Setpoints actual Plant Ve the Effluent Ch Setpoints will n not utilize Char	IDENT you have to access the running status of 2-HVE-6A, VE-7A, 2-HVE-7B, 2-HVE-8A, 2-HVE-8B, 2-HVE-10A and determine actual Plant Vent exhaust flow rate ft3/minute. This is the hould be inserted into Plant Vent #2 Skid's Monitor Item #060 with for Alert and High Alarms in units of uCi/sec calculated by using the ent exhaust flow during the Accident. If fan operating status-changes, annel 624 uCi/sec indication and existing Alert and High Alarm tot be valid for a new flow rate. This is the reason that EPIP-14 does neel 624 indication for calculating off-site dose.
q - During an outages slightly above of less than the H Containment M	ge, the Low Range gas activity ALERT Alarm Setpoint may be set to outage anticipated activity levels, but shall always be set to a value igh Alarm Setpoint. Examples of outage activities are initiating a lain Purge and venting the S/G primary side bowls.
FUSAR - Channel li The setpo 3.11.2.1.b does not i noted.	isted FUSAR, but not required by ODCM Control 3.3.10 Table 3.3-13. bints are used to provide alarm well before exceeding-ODCM Control Site Dose Rate Limit. The inoperability of a FUSAR channel above involve an ACTION statement unless TS (Technical Specification) is
2 x Bkg., 3 x Bkg., 5 is the app evaluated Determina	x Bkg. etc., denotes the number of times the normal channel reading ropriate Alarm Setting. These type of setpoints should be periodically to insure alarm sensitivity is maintained as per CY-SL-104-0112, ation of Process Radiation Monitor Setpoints.

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TABLE 4.3-9 RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS (4)

(Page 1 of 2)

-	INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	Modes in which surveillance required
1.	Waste Gas Holdup System					
	a) Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release	Р	Р	R (3)	Q (1)	*
2.	Condenser Evacuation System					
	a) Noble Gas Activity Monitor	D	M	R (3)	Q (2)	**
3.	Plant Vent System					
	a) -Noble Gas Activity Monitor	D	⁻M	R (3)	Q (2)	*
	b) Iodine Sampler	W	N.A.	N.A.	N.A.	*
	c) Particulate Sampler	W	N.A.	N.A.	N.A.	*
	e) Sampler Flow Rate	D	N.A.	R	N.A.	*
4.	Fuel Storage Area Ventilation System					
	a) Noble Gas Activity Monitor	D	M	R (3)	Q (2)	*
-	b) Iodine Sampler	W-	N.A.	N.A.	N.A.	*
	c) Particulate Sampler	W	N.A.	N.A.	N.A.	*
	e) Sampler Flow Rate Monitor	_ D	- N.A.	R	N.A.	*
_5.	Steam Generator Blowdown Building Vent					
	a) Noble Gas Activity Monitor	D	M	R (3)	Q (2)	*
	b) Iodine Sampler	W	N.A.	N-A.	N.A.	*
	c) Particulate-Sampler		N.A.	N.A.	_N.A [_] .	*
	e) Sampler Flow Rate-Monitor	D	N.A.	R	N.A.	*
6.	Cask Handling Facility (CHF) Vent					
	a) Sampler Flow Rate Monitor	D	_N.A.	Annual	N.A	***

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	C-20	 D	ST. LUCIE PLANT			
	RAD	OACTI	TABLE 4.3-9 VE GASEOUS EFFLUENT MONITORING INSTRUME SURVEILLANCE REQUIREMENTS (4) (Page 2 of 2)	NTATION		
-			TABLE NOTATIONS			
* -	At all	times w	hen making releases via this pathway.			
** -	At all	times w	hen air ejector exhaust is not directed to plant vent.			
*** -	At all	times w	hen Cask Handling Vent (CHF) is operative.			
(1)	The (this⁻p condi	CHANNE athway tions ex	EL FUNCTIONAL TEST shall also demonstrate automa and control room alarm annunciation occurs if any of the ist:	itic isolation of te following		
	1.	Instrur	nent indicates measured levels above the alarm/trip se	tpoint or		
ļ	2.	Circuit	failure or			
	3.	3. Instrument indicates a downscale failure or				
	4.	Instrur	nent controls not set in operate mode.			
(2)	The (annu	CHANNI nciation	EL FUNCTIONAL TEST shall also demonstrate that co occurs if any of the following_conditions exist:	ntr <u>ol</u> room alarm		
	1.	Instrur	nent indicates measured levels above the alarm/trip se	tpoint or		
	2.	Circuit	failure or			
	3.	Instrur	nent indicates a downscale failure or			
	4.	Instrur	ment controls not set in operate mode.			
(3)	The i refere (NIST the N range subse initial	nitial CF ence sta () or usi IST. Th of ener equent (calibrat	IANNEL CALIBRATION shall be performed using one of indards traceable to the National Institute of Standards ing standards that have been calibrated against standar bese standards should permit calibrating the system over rgy and rate capabilities that are typical of normal plant CHANNEL CALIBRATION, button sources that have be ion may be used.	or more of the & Technology ds certified by er its intended operation. For en related to the		
(4)	The r the IN (Refe	equirem NSTRUN erence C	nents to perform the surveillances is not applicable, if Ta MENT MINIMUM CHANNELS OPERABLE as not appli CR 99-0361, PMAI 99-04-106).	able 3.3-13 list cable (N.A.).		

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C-200	ST. LUCIE PLANT
<u>3/4.1</u> 1 RAI	DIOACTIVE EFFLUENTS
<u>3/4.11.1 LIQU</u>	ID EFFLUENTS
CONCENTRATIC	<u>)N</u>
CONTROLS	
3.11.1.1 In acco radioac (see TS in 10 C radionu entrain micro-0	rdance with the St. Lucie Plant TS 6.8.4.f.2) and 3), the concentration of tive material released in liquid effluents to UNRESTRICTED AREAS 5 Figure 5.1-1) shall be limited to ten times the concentrations specified FR Part 20.1001-20.2401, Appendix B, Table 2, Column 2 for clides other than dissolved or entrained noble gases. For dissolved or ed noble gases, the concentration shall be limited to 2.E-04 Curie/ml total activity.
APPLICABILITY:	At all times.
ACTION:	
a. With the co UNRESTR concentrat	ncentration of radioactive material released in liquid effluents to ICTED AREAS exceeding the above limits, immediately restore the ion to within the above limits.
SURVEILLANCE	REQUIREMENTS
4.11.1.1.1 Rac sam	ioactive liquid-wastes shall be_sampled and analyzed according to the pling and analysis program of Table 4.11-1.
4.11.1.1.2 The the con Cor	results of the radioactivity analyses shall be used in accordance with methodology and parameters in the ODCM to assure that the centrations at the point of release are maintained within the limits of trol 3.11.1.1.
4.11.1.1.3 Pos peri pos OD mai	t-release analyses of samples composited from batch releases shall be ormed in accordance with Table 4.11-1 and results of the previous t-release analyses shall be used with the calculational methods in the CM to assure that the concentrations at the point of release were intained within the limits of Control 3.11.1.1.

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			OSE CALCOLATION MANOAE (OBOM)		
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RADIOACT	<u>IVE LIQUI</u>	TAB <u>D WASTE S</u> (Pa	LE 4.11-1 <u>AMPLING AI</u> ge 1 of 4)	ND ANALYSIS PR	COGRAM
⁻ Liquid Release Type ⁻		Sampling Frequency	Minimum Analysis Frequency_	Type of Activity_ Analysis	Lower Limit of Detection LLD (1) (µCi/ml)
A. Batch Waste Releas	se-Tanks (2)	Р	Each Batch	P.G.E. (3)	5.E-07
	``	Each Batch		I-131	1.E-06
		P One Batch/M	M	Dissolved and Entrained Gases (Gamma Emitters)	1.E-05
-	ļ	P	M	H-3	1.E-05
	ļ	Each Batch	Composite (4)	Gross Alpha	1.E-07
-	ļ	P	Q	Sr-89, Sr-90	5.E-08
		Each Batch	Composite (4)	C-14, Fe-55, Ni-63	1.E-06
B. Continuous Release	es (5, 6)	Daily	4/M	P.G.E.(3)	5.E-07
		Daily	Composite	I-131	1.E=06
L.			4/M Composite	Dissolved and Entrained Gases (Gamma Emitters)	1.E-05
	ļ	Deily	M	H-3	1.E-05
	ļ	Daily	Composite	Gross Alpha	1.E-07
	1	Deily	Q	Sr-89, Sr-90	5.E-08
		Daily	Composite	C-14, Fe-55, Ni-63	1.E-06
C. East/West Settling F	3asins (7)	W	1/1/	P.G.E. (3)	5.E-07
<u></u>		Grab Sample	v v	I-131	1.E-06
D. Settling Basin as a l	Batch	P Each Batch (8)	Each Batch	P.G.E. (3)	5.E-07
Release Pathway. (9)			I-131	1.E-06
(Reference CR 99 <u>-</u> 1 99-08-084 PMAI-01 (12)_CR 2010=296.	1165 PMAI -04-115			Dissolved and Entrained Gases (Gamma Emitters)	1.E-05
(13) AR 01967018	ł			H-3	1.E-05
		Each Batch	Each Batch_	Gross Alpha	1.E-07
				Sr-89, Sr-90	5.E-08
				C-14, Fe-55, Ni-63	1.E-06
E. Groundwater Dewa	tering	W (11)	W (11 <u>)</u>	H-3	1E-05
Batch Releases (10	<i>)</i>			P.G.E. (3)	5.E-07
	-			H-3	1E-05
		D		P.G.E. (3)	5.E-07
		Each Batch	Each Batch	Gross Alpha	1.E-07
i l				Sr-89, Sr-90	5.E-08
				C-14, Fe-55, Ni-63	1.E-06

P.G.E. - Denotes Principal Gamma Emitter

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RADIOA	TABLE 4.11-1 CTIVE LIQUID WASTE SAMPLING AND ANALYSIS PRO (Page 2 of 4)	<u>DGRAM</u>			
	TABLE NOTATIONS				
(1) The LLD is radioactive backgroun falsely con	defined for purposes of these controls, as the smallest co material in a sample that will yield a net count, above sys d, that will be detected with 95% probability with only 5% p cluding that a blank observation represents-a real signal.	ncentration of tem probability of			
For a partie	ular-measurement system, which may include radiochem	ical separation:			
	-l-l D - 4.66_S₀				
	$E \bullet V \bullet 2.22E + 06 \bullet Y \bullet \exp(-\lambda_{\bullet} \Delta T)$				
Where:					
LLD	the a priori lower limit of detection (micro-Curie per unit mass or volume),				
Sb	the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (counts per minute),				
E	-the counting efficiency (counts per disintegration),				
V	the sample size (units of mass or volume),				
2.22E+06	the number of disintegrations per minute per micro-Curie.,				
Y	the fractional radiochemical yield, when applicable,				
λ	the radioactive decay constant for the particular radionuclide (sec and				
ΔΤ	the elapsed time between the midpoint of sample collection and- the time of counting (sec).				
Typical val	ues of E, V, Y and ΔT should be used in the calculation.				
It should b representin (after the f	e recognized that the LLD is defined as an <u>a priori</u> (before ig the capability of a measurement system and not as an <u>a</u> act) limit for a particular measurement.	the fact) limit <u>a posteriori</u>			
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	RADIOACT	TABLE 4.11-1 IVE LIQUID WASTE SAMPLING AND ANALYSIS PR (Page 3 of 4)	OGRAM		
		TABLE NOTATIONS (continued)	Î		
(2)	A batch relea sampling for a method des	se is the discharge of liquid wastes of a discrete volum analyses, each batch shall be isolated and then thoroug cribed in the ODCM to assure representative sampling	e. Prior to ghly mixed by		
(3)	The principal following radi Cs-137 and C are to be con those of the a Radioactive E outlined in Re	gamma emitters for which the LLD control-applies inclu onuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99 Ce-141 and Ce-144. This list does not mean that only-t sidered. Other gamma peaks that are identifiable, toge above=nuclides, shall also be analyzed and reported in t Effluent Release Report pursuant to Control 3.11.2.6 in egulatory Guide 1.21, Appendix B, Revision 1, June 19	ude the , Cs-134, hese nuclides ether with the Annual the format 74.		
(4)	A composite a the quantity c employed res	sample is one in which the quantity of liquid sampled is If liquid waste discharged and in which the method of s sults in a specimen that is representative of the liquids r	proportional to ampling eleased.		
(5)	A continuous e.g., from a v release.	release is the discharge of liquid wastes of a nondiscre olume of a system that has an input flow during the cor	ete volume, ntinuous		
(6)	If Component activit <u>y</u> on the less than or e analysis in ac	t Cooling-Water activity is > 1.E-5 μ Ci/ml, perform a we intake Cooling Water System outlet to ensure the acti qual to 2.E-07 μ Ci/ml LLD limit. If ICW is >2.E-07 μ Ci/ cordance with a Plant Continuous Release on this Tab	ekly gross vity level is ml, perferm le.		
(7)	Grab samples leakage indic background.	s to be taken when there is confirmed primary to secon ated by the air ejector monitor indicating greater than o	dary system r equal to 2x		
(8)	At least two ir requirement⁻f quałified-men calculations.	ndependent samples are analyzed in accordance with to or concentration limit of control 4.11.1.1.1 and at least onbers of the facility staff independently verify the releas	he surveillance two technically e rate		
(9)	The settling b CY-SL-102-0 absence of a basin does no pathway). Th FL002208) to from the East	pasin(s) may receive low level activity per the guidance 104, therefore these samples shall be taken regardless primary-to-secondary leak (note (7) on liquid release ty ot apply to liquid release type [D] settling basin as a bat the South Basin (pond) is a permitted outfall (per FDEP the intake canal. An authorized "bypass" is required to a or West Basins.	of of the vpe [C] settling tch release Permit pump directly		

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		TABLE 4.11-1	
	RADIOAC1	TIVE LIQUID WASTE SAMPLING AND ANALYSIS PROG	RAM
		(r_age 4 01 4 <u>)</u>	
		TABLE NOTATIONS (continued)	
(10)	Applies to gr Protected An levels. This samples that in the dewate dewatering p groundwater (e.g., IVW p for these rele established i shall be reco analysis of th	oundwater dewatering discharges from locations outside the ea where radiological contamination is not expected at sign expectation may be a judgment based on local and peripher t indicate radiological contaminant levels below the LLD from ering pump's zone of influence. These samples may includ pump well samples (taken by small-volume sample pumps), r samples, and upgradient samples taken from surface water percolation basins) within the zone of influence. The sampli- eases shall be precautionary in nature. A conservative valu in the discharge permit for the effluent activity; however, the percoled with actual activity concentrations ascertained from the actual effluent.	e Plant hificant eral m sources e upgradient ers ng_protocol e shall be e permit sample
(11)	Each outfall a frequency de has not yet a reached its s wells of an o be extended	shall be sampled at some point in the discharge header at t escribed herein. Any outfall that includes a well (or well poin achieved its steady state flow rate (indicating that it has not steady state zone of influence) shall be sampled weekly. At outfall reaches steady state, the sampling and analysis frequ to monthly.	the nt) that yet fter the lency may
(12)	CR 2010-296 Basins to the tritium releas releases) rep points and th	6; Radiological Impact Evaluation of Effluent Releases from e East Settling Pond (Dec. 2009). It was determined that po ses via evaporation from the East Settling Pond alone (i.e. g presents <1.0% of the total activity released-via all gaseous herefore, does not qualify as significant release point.	Catch otential gaseous release
(13)	Under emerg waive the red samples prio hour period f where plant i based on pla Pond Releas effectiveness change.	gency conditions, the Shift Manager and Chemistry Manage quirement to analyze the gamma spectroscopy, tritium, and or to starting the release. Analyses must be completed with following the initiation of a discharge. An "emergency" is a flooding, personnel injury, or damage to plant equipment ar ant conditions. AR 01967018, Site Evaluation for Expediting ses (May 2014), provides site documentation and justifications is of the radioactive effluent control program is not reduced	er may alpha in a 24 condition re likely g South on that the by the

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RADIOA	CTIVE EFF	LUENTS	
DOSE			
CONTRO	DLS		
3.11.1.2	In accord commitm liquid efflu Figure 5.1	ance with St. Lucie Plant TS 6.8.4.f.4) and 6.8.4.f.5), the ent to a MEMBER OF THE PUBLIC from radioactive m uents released, from each unit, to UNRESTRICTED AR 1-1) shall be limited:	e dose or dose aterials in EAS (see TS
	a. Du wh	ring any calendar quarter to less than or equal to 1.5 m lole body and to less than or equal to 5 mrems to any o	rems to the rg <u>a</u> n and
	b. Đu bo	ring any calendar year to less than₋or equal to 3 mrems dy and to less than-or equal to 10 mrems to any organ.	s to the whole-
APPLICA	BILITY:	At all times.	
ACTION:	-		
a. W ex da ⁻ ex re su	ith the calc ceeding ar lys, pursua ceeding th duce the re ibsequent r	culated dose from the release of radioactive materials in by of the above limits, prepare and submit to the Comm ant to Plant TS 6.9.2, a Special Report that identifies the e-limit(s) and defines the corrective actions that have be beleases and the proposed corrective actions to be taken releases will be in compliance with the above limits.	liquid effluents ission within 30 cause(s) for een taken-to to assure that
SURVEII	LANCE R	EQUIREMENTS	
4.1-1.1.2	Cumulativ	ve-dose contributions from liquid effluents for the curren	t calendar ordance-with

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RADIOACT	IVE EFF	LUENTS	
LIQUID RAI	OWASTE	TREATMENT SYSTEM	· · · · · · · · · · · · · · · · · · ·
CONTROLS	6		
3.11.1.3 In .T .st	accorda reatment nall be us the liqui gure 5.1 rgan in a	ance with St. Lucie Plant TS 6.8.4.f.6), the Liquid Radw System shall be OPERABLE and appropriate portions sed to reduce releases of radioactivity when the project id effluent, from each unit, to UNRESTRICTED AREAS -1)_would exceed 0.06 mrem to the whole body or 0.2 31-day period.	aste s of the system ted doses due S (see TS mrem to any
APPLICABI	<u>LITY:</u>	At all times.	
ACTION:			
a. With the a opera TS 6	radioacti bove lim ation, pre .9.2, a Sp	ive liquid waste being discharged without treatment and its and any portion of the Liquid Radwaste Treatment S epare and submit to the Commission within 30 days, pu pecial Report that includes the following information:	d ⁻ in excess of System not in Irsuant to Plant
1.	Explan identifi the ino	ation of why liquid radwaste was being discharged with cation of any inoperable equipment or subsystems and perability,	nout treatment, I the reason for
2.	Action and_	(s) taken to restore the inoperable equipment to OPER	ABLE status₋
3.	Summ	ary_description of action(s) taken to prevent a recurren	ce.
SURVEILLA	ANCE RE	EQUIREMENTS	
4.11.1.3.1	Doses shall b methoo Treatm	due to liquid releases from each unit to UNRESTRICT e-projected at least once per 31 days in accordance wi dology and parameters in the ODCM when Liquid Rady ment Systems are not being fully utilized.	ED AREAS th the waste
4.11.1.3.2	The ins OPER for at le system previou	stalled Liquid Radwaste Treatment System shall be de ABLE by operating the liquid radwaste treatment syste east 30 minutes at least once per 92 days unless the liq has been utilized to process radioactive liquid effluent us 92 days.	monstrated m equipment quid radwaste ts during the

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RADIOACTIVE EFFI	LUENTS	
<u>3/4.11.2 GASEC</u>	OUS EFFLUENTS	
DOSE RATE		
CONTROLS		
3.11.2.1 In accorda from-radio the SITE E	ance with St. Lucie Plant TS 6.8.4.f.3) and 7), the dose active materials released in gaseous effluents to areas 3OUNDARY (see TS Figure 5.1-1) shall be limited to th	rate_resulting at or beyond ne following:
a. For and	able gases: Less than or equal to 500 mrems/yr-to the skin and less than or equal to 3000 mrems/yr to the skin and	he total body
⁻b. For part 150	lodine-131, for lodine-133, for tritium and for all radion ticulate form with half-lives greater than 8 days: Less t 00 mrems/yr to any organ	uclides in han or equal to
APPLICABILITY:	At all times.	
ACTION:		
a. With the_dose rate to within t	e rate(s) exceeding the above limits,-immediately restor the above limit(s).	e the release
SURVEILLANCE RE	EQUIREMENTS	
4.11.2.1.1 The do to be w parame	ose rate due to noble gases in gaseous effluents shall b vithin the above limits in accordance with the methodol eters in the ODCM.	e determined ogy and
4.11.2.1.2 The do particu be dete method sample analysi	ose rate due to lodine-131, lodine-133, tritium and all ra late form with half-lives greater than 8 days in gaseous ermined to be within the above limits in accordance wit dology and parameters in the ODCM by obtaining repre- es and performing analyses in accordance with the san is program specified in Table 4.11-2.	dionuclides in effluents shall h the esentative ppling and

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	RADIOACTIV	<u>E GASEO</u>	TABL US WASTE S (Pag	.E⁻4.11-2 SAMPLING A e 1 of 3)	ND ANALYSIS P	ROGRAM
						·
	Gaseous Release	е Туре	-Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection LLD (1) (μCi/ml)
1.	Waste Gas Storage	Tank ·	P Each Tank Grab Sample	P Each Tank	Noble Gas P.G.E. (2)	1.E-04
2.	Containment Purge	(9)	P Each Purge (6)	P -Each Purge (6)	- Noble Gas- P.G.E. (2)	1.E-04
	Vonte:(0)	_	Grab Sample	(7) <u>4/M (7)</u>	H-3 Noble Gas	1.E-06
) .	vents.(9)		Grab Sample		P.G.E. (2)	1.E-04
	aPlant b. Fuel Bldg (5) c. S/G Blewdowr	n Bldg.	(8) -	-	H-3	1.E <u>-</u> 06
ļ.	All Release Types a above-(9)	as listed in 3.	Continuous (3) (8)	4/M Charcoal Sample (4)	I-131	1.E-12
				4/M Particulate Sample (4)	P.G.E.	1.E-11
				4/M Particulate Sample	Gross Alpha	1.E-11
				Q Composite Particulate Sample	Sr-89, Sr-90	1.E-11
				Noble Gas - Monitor	Noble Gases Gross Beta or Gamma	1.E-06
5.	Cask Handling Faci	lity Vent (8)	W Grab Sample	W	Noble Gas P.G.E. (2)	1. E-04
			(8)		H-3	1.E-0€-
				W Charcoal Sample	I-131	1.E-12
				W Particulate Sample	P.G.E.	1.E-11
			Continuous (8)-	W Particulate Sample	Gross Alpha	1.E-11
				Q Composite Particulate Sample	Sr-89, Sr-90	1.E-11

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<u>R/</u>		VE	TABLE 4.11-2 E GASEOUS WASTE SAMPLING AND ANALYSIS P (Page 2 of 3)	<u>'ROGRAM</u>
(1) Th ra ba fa	ne LLD is d dioactive n ackground, lsely concli	lef na th ud	Fined for purposes of these controls, as the smallest controls in a sample that will yield a net count, above system will be detected with 95% probability with only 5% ling that a blank observation represents a real signal.	oncentration of stem probability of
- Fo	or a particu	la	r-measurement system, which may include radiochem	nical separation:
			$LLD = \frac{4.66 S_b}{E \cdot V \cdot 2.22E + 06 \cdot Y \cdot \exp(-\lambda \cdot \Delta T)}$	-
W	here:			
LL	.D =	=	the a priori lower limit of detection (micro-Curie per volume),	unit mass or
LL	.D =	=	the a priori lower limit of detection (micro-Curie per volume),	unit mass or
S	, =	=	the standard deviation of the background counting r counting₋rate of a blank sample as appropriate (cou	ate or of the nts per minute),
E	=	=	the counting efficiency (counts per disintegration),	
V	=	= .	the sample size (units of mass or volume),	
2.	22E+06- =	=	the number of disintegrations per minute per micro-	Curie.,
Y	=	=	the fractional radiochemical yield, when applicable,	
λ	=	=	the radioactive decay_constant for the particular rad	ionuclide (sec ⁻¹)
Δ	Г =	=	the elapsed time between the midpoint of sample co the time of counting (sec).	ollection and
τı	pical value	es	of E, V, Y and ΔT should be used in the calculation.	
lt re (a	should be presenting fter the fac	re tr t)	cognized that the LLD is defined as an <u>a priori</u> (before ne capability of a measurement system and not as an limit for a particular measurement.	e the fact) limit <u>a posteriori</u>

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-	RADIOACT	TABLE 4.11-2IVE GASEOUS WASTE SAMPLING AND ANALYSIS P(Page 3 of 3)	ROGRAM
		TABLE NOTATIONS- (continued)	
	The principa following rad noble gas re Cs-137, Ce- mean that o identifiable, reported in t Control_3-11 Revision 1,	al gamma emitters for which the LLD-control applies inclu dionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135 and eleases and Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, -141 and Ce-144 in lodine and particulate releases. This only these nuclides are to be considered. Other gamma p together with those of the above nuclides, shall also be a the Annual Radioactive Effluent Release Report pursuan 1.2.6 in the format outlined in Regulatory Guide 1.21, App June 1974.	Ide the 3 Xe-138 in 1-131,-Cs-134; 5 list does not beaks that are analyzed and t to bendix B,
(3)	The ratio of for the time accordance	the sample flow rate to the sampled stream flow rate sha period covered by each dose or dose rate calculation ma with Controls 3.11.2.1, 3.11.2.2 and 3.11.2.3.	all-be known- ade in
(4)	Samples sh completed w shall also be each shutdo THERMAL 48 hours of correspondi not apply if: in the reacto gas monitor	all be changed at least four times per month and analyse within 48 hours after changing or after removal from same e performed at least once per 24 hours for at least 7 days own, startup or THERMAL POWER change exceeding 15 POWER within a 1-hour period and analyses shall be cor changing. When-samples collected for 24 hours are ana ing LLDs may be increased by a factor of 10. This requir (1) analysis shows_that the DOSE EQUIVALENT I-131 or coolant has not increased more than a factor of 3; and shows that effluent activity has not increased by more tha	es shall be oler. Sampling 5% of RATED mpleted within alyzed, the ement does concentration (2) the noble an a factor of 3.
<u>(</u> 5)	Tritium grab the spent fu	o samples shall be taken at least 4/M from the ventilation lel pool area, whenever spent fuel is in the spent fuel poo	exhaust from I.
(6)	Sampling an THERMAL F 1 hour unles the primary of activity moni	nd analysis shall also be performed following shutdown, start POWER change exceeding 15% of RATED THERMAL POV is (1) analysis shows that the DOSE EQUIVALENT I-131 co coolant has not increased more than a factor of 3; and (2) the itor shows that effluent activity has not increased by more that	up or a VER within ncentration in e noble gas an a factor of 3.
	Tritium anal	lycic may be delayed for up to 14 days if the LLD is still a	
(7)	new countir	ng time.	ttainable at the

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(9) Du eff as an	iring outag luent pathy per proced nual report	es, the affected unit's containment equipment hatch is a vay. Monitoring of the open containment equipment hat dural guidance. Any calculated release quantity will be RADIOACTIVE EFFLUENTS	a potential tch is performed reported in the
DOSE - N	NOBLE GA	SES	
CONTRC	DLS		· -
3.11.2.2	In accorda noble gas beyond th following:	ance with St. Lucie Plant TS 6.8.4.f.5) and 8), the air do es released in gaseous effluents, from each unit, to are le SITE BOUNDARY (see TS Figure 5.1-1) shall be lim	ese due to eas at and ited to⁻the
	a. Du rac	ring any calendar quarter: Less than or equal to 5 mra liation and less than or equal to 10 mrads for beta radia	ds for gamma ation-and
	b. Du rac	ring any calendar year: Less than or equal to 10 mrade liation and less than or equal to 20 mrads for beta radia	s for gamma ation.
APPLICA	<u>BILITY:</u>	At all times.	
<u>ACTION:</u>			
a. Wi ex da ex as	ith the calc ceeding ar ys, pursua ceeding th sure that s	ulated air dose from-radioactive noble gases in gaseou by of the above limits, prepare and submit to the Comm nt to Plant TS 6.9.2, a_Special Report that identifies the e limit(s) and defines the corrective actions that have be ubsequent releases will be in compliance with the abov	s effluents ission within 30 cause(s) for een taken to re limits.
SÜRVEIL	LANCE R	EQUIREMENTS	
4.11.2.2	Cumulativ calendar	ve dose contributions_for the current calendar quarter an year for noble gases shall be determined in accordance	nd current_ e with the

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RADIOA	CTIVE EFF	LUENTS	
DOSE - I	ODINE-13	1. IODINE-133. TRITIUM-AND RADIOACTIVE MATER	IAL IN
<u>F</u>	PARTICUL	ATE FORM	
CONTRO	DLS	,	
3.11.2.3	In accord OF THE F particulate released, TS Figure	ance with St. Lucie Plant TS 6.8.4.f.5) and 9), the dose PUBLIC from lodine-131, lodine-133, tritium and all radi e form with half-lives greater than 8 days in gaseous eff from each unit, to areas at and beyond the SITE BOUN 9 5.1-1) shall be limited to the following:	to a MEMBER onuclides in luents IDARY (see
	a. ⁻Du org	ring any calendar quarter: Less than or equal to 7.5 mi jan and,	ems to any
	b. Du	ring any calendar <u>y</u> ear: Less than or equal to 15 mrem	s to any organ.
APPLICA	BILITY:	At all times.	
ACTION:			
a. W rac eff wi ca be ab	ith the calc dionuclides fluents-exc thin-30 day use(s) for o en taken to ove limits.	ulated dose from the release of lodine-131, lodine-133, in particulate-form with half-lives-greater than 8 days, i eeding any of the above limits, prepare and submit to th rs, pursuant to Plant TS 6.9.2, a Special-Report that ide exceeding the limit(s) and defines-the corrective actions o assure that subsequent releases will be in compliance	tritium and n gaseous te Commission ntifies the that have with the
SURVEIL	LANCE R	EQUIREMENTS	-
4.11.2.3	Cumulativ calendar form with the metho	ve dose contributions for the current calendar quarter an year for lodine-131, lodine-133, tritium and radionuclide half-lives greater than 8 days shall be determined in ac odology and parameters in the ODCM at least once per	nd current s in particulate cordance with 31 days.

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<u>GASEO</u>		WASTE TREATMENT SYSTEM	
CONTR	OLS		
3.11.2.4	In acco Treatm OPER/ release effluen (see Ta	ordance with St. Lucie Plant TS 6.8.4.f.6), the VENTILATIC nent System and the WASTE GAS HOLDUP SYSTEM sha ABLE and appropriate portions of the system shall be used es of radioactivity when the projected doses in 31 days due t releases, from each unit, to areas at and beyond the SIT S Figure 5.1-1) would exceed:	N EXHAUST Il be I to-reduce to gaseous E BOUNDARY
	a.	0.2 mrad-to air from gamma radiation or	
	b.	0.4 mrad to-air from beta radiation or	
	C.	0.3 mrem to any organ.	
APPLIC	ABILITY:	At all times.	
	<u>l:</u>		
a. V o p	Vith radio of the abo oursuant-t oformatio	active gaseous waste being discharged without treatment ve limits, prepare and submit to the Commission within 30 o Plant TS 6.9.2, a Special Report that includes the followi n:	and∹in excess days <u>,</u> ng
1	. Ide the	ntification of any inoperable equipment or subsystems and inoperability,	the reason for
2	. Act and	ion(s) taken to restore the inoperable equipment to OPER.	ABLE status
3	. Sur	mmary description of action(s) taken to prevent a recurrent	ce.

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RADIOACTIVE EF	FLUENTS	
GASEOUS RADW	ASTE TREATMENT SYSTEM (continued)	
SURVEILLANCE F		
4.11.2.4.1 Dose SITE accor Gase	s due to gaseous releases from each unit to areas at an BOUNDARY shall be projected at least once per 31 day dance with the methodology and parameters in the OD ous Radwaste Treatment Systems are not being fully u	nd beyond the ys in CM when illized.
4.11.2.4.2 The in WAS opera VENT minut utilize days.	nstalled VENTILATION EXHAUST TREATMENT SYSTI FE GAS HOLDUP SYSTEM [™] shall be demonstrated OP ting the WASTE GAS_HOLDUP SYSTEM equipment ar TLATION EXHAUST TREATMENT SYSTEM equipment es, at least ence per 92 days unless the appropriate systed to process radioactive gaseous effluents during the p	EM and ERABLE by nd it for at least 30 stem has been revious 92
* - If the WAST FUNCTION/ performed (i once per 92	E GAS HOLDUP SYSTEM is not being fully utilized, an AL TEST on the WASTE GAS HOLDUP SYSTEM shall n addition to the requirements of 4.11.2.4.2's "at least 3 days, by performing the following:	Administrative also be 9 minutes")
1) Place	a Gas Decay Tank (containing less than 30 psi) in⁻serv	rice.
2) With 150 p	a Waste-Gas Compressor, charge the Gas Decay Tank si.	to at least
3) Follov Deca Activi	ving appropriate holdup decay time, sample and release y Tank with an OPERABLE-Waste Gas Holdup System ty Monitor (per TABLE 3.3-13).	e the Gas Noble Gas
4) If disc SYST comp	repancies exist, repairs shall be made and the WASTE EM Administrative FUNCTIONAL TEST shall be repeat leted successfully.	GAS HOLDUP

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<u>3/4.11.4 TOT</u>	AL DOSE	
CONTROLS		
2 44 4		1
J. 11.4 In accol dose or	dance with St. Lucie Plant 15 6.8.4.1.10), the annual (ca dose commitment to any MEMBER OF THE PUBLIC du	lendar year) le to releases of

dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to radiation from uranium fuel cycle sources shall be limited to less than or equal to 25 mrems to the whole body or any organ, except the thyroid, which shall be limited to less than_or equal to 75 mrems.

<u>APPLICABILITY:</u> At all times.

ACTION:

With the calculated doses from the release of radioactive materials in liquid or a. gaseous effluents exceeding twice the limits of Control 3.11.1.2.a, 3.11.1.2.b, 3.11.2.2.a, 3.11.2.2.b, 3.11.2.3.a or 3.11.2.3.b, calculations shall be made including direct radiation contributions from the units (including outside storage tanks etc.) to determine whether the above limits of Control 3.11.4 have been exceeded. If such is the case, prepare and submit to the Commission within 30 days, pursuant to Plant TS 6.9.2, a Special Report that defines the corrective action to be taken to reduce subsequent releases to prevent recurrence of exceeding the above limits and includes the schedule for achieving conformance with the above limits. This Special Report, as defined in Subpart M of 10 CFR Part 20, shall include an analysis that estimates the radiation exposure (dose) to a MEMBER OF THE PUBLIC from uranium-fuel cycle sources, including all effluent pathways and direct radiation, for the calendar year that includes the release(s) covered by this report. It shall also describe levels of radiation and concentrations of radioactive material involved and the cause of the exposure levels or concentrations. If the estimated dose(s) exceeds the above limits and if the release condition resulting in violation of 40-Part 190 has not already been corrected, the Special Report shall include a request for a variance in accordance with the provisions of 40 CFR Part 190. Submittal of the report is considered a timely request and a variance is granted until staff action on the request is complete.

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<u>3/4.11.4</u>	TOTAL	<u>_DOSE</u> (continued)	
SURVEIL	LANCE RE	EQUIREMENTS	
4.11.4.1	Cumulativ determine accordanc	e dose contributions from liquid and gaseous effluents d in accordance with Controls 4.11.1.2, 4.11.2.2 and 4 ce with the methodology and parameters in the ODCM.	shall be 11.2.3 and in
4.11.4.2	Cumulativ outside sto (ISFSI) sh parameter set forth in	e dose contributions from direct radiation from the units orage tanks etc.) and Independent Spent Fuel Storage all be determined in accordance with the methodology rs in the ODCM. This requirement is applicable only ur n ACTION a. of Control 3.11.4.	s (including Installation and ider conditions

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RADIOACT	IVE EFF	LUENTS
<u>3/4.11.5</u>	MAJO	R CHANGES TO RADIOACTIVE LIQUID, GASEOUS AND SOLI
	WAST	E IREAIMENT-SYSTEMS*
ADMINISTR	RATIVE	CONTROLS
3.11.2.5 Li ga	censee aseous a	initiated major changes to the radioactive waste_systems (liquid, and solid):
1)	Sh Re the	all be reported to the Commission in the Annual Radioactive Efflue lease Report for the period in which the evaluation was reviewed on Site Review Group (ORG). The discussion of each shall com
-	a)	A summary of the evaluation that led to the determination that change could be made-in accordance with 10 CFR 50.59.
	b)	Sufficient detailed information to totally support the reason for change without benefit of additional or supplemental informati
	c)	A detailed description of the equipment, components and processes involved and the interfaces with other plant system
_	d)	An evaluation of the change which shows the predicted release of radioactive materials in liquid and gaseous effluents and/or quantity of solid waste that differ from those previously-predict in the license application and amendments thereto;-
	e)	An evaluation of the change which shows the expected maxim exposure to individuals in the UNRESTRICTED AREA and to general population that differ from those previously estimated the license application and amendments thereto;
	f)	A comparison of the predicted releases of radioactive materia in liquid and gaseous effluents and in solid_waste, to the actua releases for the period when the changes are to be made;
	g)	An estimate of the exposure to plant operating personnel as a result of the change; and
	h)	Documentation of the fact that the change was reviewed and found acceptable by the ORG.

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3/4 11 6	ANNU	AL RADIOACTIVE FEELLENT RELEASE REPORT TO	
<u>or 111 1.0</u>	- <u>COMN</u>	<u>IISSION*</u>	
ADMINISTR	RATIVE (CONTROLS	
3.11.2.6 As Ri - or re ga pr th cc Pa a.	s per Ter eport con- port sha aseous e rovided s rough f) onformar art 50. The the rele Eva Rac Coo sun the	chnical Specification 6.9.1.7, a Annual Radioactive Efflu vering the operation of each unit during the previous 12 shall be submitted within 60 days after January 1 of each all include a summary of the quantities of radioactive lique effluents and solid waste released from each unit. The re- shall be (1) consistent with the objectives outlined in by below, using the example report format in the ODCM and the with 10-CFR_50.36a and Section IV.B.1 of Appendix e Radioactive Effluent Release Reports shall include a se quantities of radioactive liquid and gaseous effluents a eased from the unit as outlined in Regulatory Guide 1.2 aluating and Reporting Radioactivity in Solid Wastes and dioactive Materials in Liquid and Gaseous Effluents fror oled Nuclear Power Plants, Revision 1, June 1974, with nmarized on a quarterly basis following the format of Ap-	uent Release months of- ch year. The uid and material items a) nd (2) be in (1 to 10 CFR- summary of nd solid waste 1, Measuring, d Releases of n Light-Water- data opendix B
b.	The after me sun ma pre of v rep rad dur	e-Radioactive Effluent Release Report to be submitted a er January 1 of each year shall include an annual summ teorological data collected over the previous year. This mmary may be either in the form of an hour-by-hour listi gnetic tape of wind speed, wind direction, atmospheric cipitation (if measured) or in the form of joint frequency wind speed, wind direction and atmospheric stability.** fort shall include an assessment of the radiation doses of lioactive liquid and gaseous effluents released from the ring the previous calendar year.	within 60 days hary of hourly annual ng on- stability and distributions. This same due to the unit or station
* - A s con unit rad	ingle sub nbine tho ts with se ioactive	omittal may be made for a multiple unit station. The sub ose sections that are common to all units at the station; eparate radwaste systems, the submittal shall specify the material from each unit.	omittal-should however, for ne releases of
** - In li has in a	ieu of su s the opti ı file that	bmission with the Radioactive Effluent Release Report, ion of retaining this summary of required meteorologica shall be provided to the NRC upon request.	the licensee data on site

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RADIOA	<u>CTIVE-E</u>	EFF	LUENTS	
<u>3/4.11.6</u>	<u>AN</u> <u>CO</u>	<u>NU</u> MN	AL RADIOACTIVE EFFLUENT RELEASE REPORT TO IISSION* (continued)	<u>) THE</u>
ADMINIS	STRATI	/E (CONTROLS	
3.11.2.6	(contin	uec	4)	
	b.	(co	ntinued)	
		This from PU Fig the sha cor effli be and me in a	s same report shall also include an assessment of the n m radioactive liquid and gaseous effluents to MEMBER BLIC due to their activities inside the SITE BOUNDARY ure 5.1-1) during the report period. All assumptions us se assessments, i.e., specific activity, exposure time ar all be included in these reports. The meteorological cor neurrent with the time of release of radioactive materials uents, as determined by sampling frequency and meas used for determining the gaseous pathway doses, or an d conservative method used in lieu of actual meteorolog asurements. The assessment of radiation doses shall accordance with the methodology and parameters in the	adiation doses S OF THE ' (see TS ed in making d location, d location, ditions in gaseous urement, shall n approximate gical be performed e ODCM.
	C.	Eve det usi out gro OD sub	ery 2 years using the previous 6 months release history ermine the controlling age group for liquid pathways. E ng-the previous 1 year or longer interval (to include a re age) and historical meteorological data determine the c up for gaseous pathways. If changed from current sub CM to reflect new tables for these groups and use the psequent dose calculations.	for isotopes, every 2-years fueling controlling age mit change to new groups in
	d.	The Jar dos rea cale give	e Radioactive Effluent Release Report to be_submitted on nuary 1 of each year shall also include an assessment of ses to the likely most exposed MEMBER OF THE PUBL correleases for the previous calendar year. Acceptab culating the dose contribution from liquid and gaseous of en in Regulatory Guide 1.109 March 1976.	50 days after of⁻radiation ⊥IC from le methods for effluents are

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3/4.11.6	AN	INUAL	RADIOACTIVE EFFLUENT RELEASE REPORT TO	<u> THE</u>
	<u>C0</u>	DMMIS	SION* (continued)	
ADMINIS	STRATI	VE CC	NTROLS	
<u> </u>	·····		······································	
3.11.2.6	(conti	nued)		
-	e.	The R inform shippe	Radioactive Effluent Release Reports shall include th nation for each class of solid waste (as defined by 10 ed offsite during the report period:	e following) CFR Part 6
		1.	Volume	
		2.	Total Curie quantity (specify whether determined by measurement or estimate)	y
		3.	Principal radionuclides (specify whether determined measurement or estimate)	d by
		4.	Type of waste (e.g., dewatered spent resin, compa evaporator bottoms)	cted dry was
-		5.	Type of container (e.g., LSA, Type A, T y pe B, Larg and	e Quantity)
		6.	Solidification agent or absorbent (e.g., cement, ure formaldehyde).	а
_	f.	The F descr AREA during	Radioactive Effluent Release Reports shall include a iption of unplanned releases from the site to UNRES AS of radioactive materials in gaseous and liquid efflu g the reporting period.	list and STRICTED Jents made
	g.	The F made PROC MANU calcul Censi	Radioactive Effluent Release Reports shall include an during the reporting period to the PROCESS CONT GRAM (PCP) and to the OFFSITE DOSE-CALCULA JAL (ODCM), as well as a listing of new locations fo lations and/or environmental monitoring identified by us of ODCM-Control 3.12.2.	ny changes- ROL TION r dose the Land Us
	h.	The for provid in an since meteo Contr	ormat for an Annual Radioactive Effluent Release Red ded in ODCM Methodology Section 4.0. The informat annual report shall not apply to any ODCM Control I the methodology for the annual report is based on a prological data, instead of historical conditions that the rols and Control required calculations are based on.	eport is ation containe Dose Limit(s) Ictual ne ODCM

50 OFFSITE DOSE CALCULATION MANUAL (ODCM) ST. LUCIE PLANT PROCEDURE NO:: ST. LUCIE PLANT RADIOACTIVE EFFLUENTS 34.11.5 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT TO THE COMMISSION" (continued) ADMINISTRATIVE CONTROLS 3.11.2.6 (continued) i. Beginning with the report due within 60 days after January 1, 2007, the Radioactive Effluent Release Report shall include the following information for the previous year: a. A listing with descriptions of any-leaks or spills that have been communicated to State and Local officials in accordance with the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR).	REVISION NO	D.:		PROCEDURE TITLE:	
PROCEDURE NO: C-200 ST. LUCIE PLANT 56 of 23 RADIOACTIVE EFFLUENTS 3/4.11.6 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT TO THE COMMISSION* (continued) ADMINISTRATIVE CONTROLS 3.11.2.6 (continued) Image: Continued 3.11.2.6 (continued) Image: Continued Image: Continued 3.11.2.6 (continued) Image: Continued Image: Continued Image: Continued Image: Continued Image: Continued <td>, 101011 (10 1</td> <td>50</td> <td></td> <td></td> <td></td>	, 101011 (10 1	50			
C-200 ST. LUCIE PLANT RADIOACTIVE EFFLUENTS 3/4.1.6 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT TO THE COMMISSION* (continued) ADMINISTRATIVE CONTROLS 3.11.2.6 (continued) i. Beginning with the report due within 60 days after January 1, 2007, the Radioactive Effluent Release Report shall include the following information for the previous year: a. A listing with descriptions of any-leaks or spills that have been communicated to State-and Local officials in accordance with the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR).	PROCEDURE	= NO.:			5 of 231
RADIOACTIVE EFFLUENTS 3/4.11.6 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT TO THE COMMISSION* (continued) ADMINISTRATIVE CONTROLS 3.11.2.6 (continued) i. Beginning with the report due within 60 days after January 1, 2007, the Radioactive Effluent Release Report shall include the following information for the previous year: a. A listing with descriptions of any-leaks or spills that have been communicated to State-and Local officials in accordance with the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR).	С_	200			
RADIOACTIVE EFFLUENTS 34.11.6 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT TO THE COMMISSION* (continued) ADMINISTRATIVE CONTROLS 3.11.2.6 (continued) a. Beginning with the report due within 60 days after January 1, 2007, the Radioactive Effluent Release Report shall include the following information for the previous year: a. A listing with descriptions of any leaks or spills that have been communicated to State-and Local officials in accordance with the Groundwater Protection INITIATIVE (NEI 07-07). b. Groundwater sample results that have been taken in support of the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR).		200			
3/4.11.6 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT TO THE COMMISSION* (continued) ADMINISTRATIVE CONTROLS 3.11.2.6 (continued) i Beginning with the report due within 60 days after January 1, 2007, the Radioactive Effluent Release Report shall include the following information for the previous year: a. A listing with descriptions of any-leaks or spills that have been communicated to State-and Local officials in accordance with the Groundwater Protection INITIATIVE (NEI 07-07). b. Groundwater sample results that have been taken in support of the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR).	RADIOA	CTIVE E	FF	<u>LUENTS</u>	
ADMINISTRATIVE CONTROLS 3.11.2.6 (continued) i. Beginning with the report due within 60 days after January 1, 2007, the Radioactive Effluent Release Report shall include the following information for the previous year: a. A listing with descriptions of any-leaks or spills that have been communicated to State-and Local officials in accordance with the Groundwater Protection INITIATIVE (NEI 07-07). b. Groundwater Sample results that have been taken in support of the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR).	<u>3/4.1</u> 1.6	AN	NU/	AL RADIOACTIVE EFFLUENT RELEASE REPORT TO TH	E
 ADMINISTRATIVE CONTROLS 3.11.2.6 (continued) Beginning with the report due within 60 days after January 1, 2007, the Radioactive Effluent Release Report shall include the following information for the previous year: A listing with descriptions of any-leaks or spills that have been communicated to State-and Local officials in accordance with the Groundwater Protection INITIATIVE (NEI 07-07). Groundwater sample results that have been taken in support of the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR). 		<u>CO</u>	MM	IISSION* (continued)	
 3.11.2.6 (continued) i. Beginning with the report due within 60 days after January 1, 2007, the Radioactive Effluent Release Report shall include the following information for the previous year: a. A listing with descriptions.of any-leaks or spills that have been communicated to State-and Local officials in accordance with the Groundwater Protection INITIATIVE (NEI 07-07). b. Groundwater sample results that have been taken in support of the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR). 	ADMINIS	TRATI\	/E C	CONTROLS	
 i. Beginning with the report due within 60 days after January 1, 2007, the Radioactive Effluent Release Report shall include the following information for the previous year: a. A listing with descriptions of any-leaks or spills that have been communicated to State-and Local officials in accordance with the Groundwater Protection INITIATIVE (NEI 07-07). b. Groundwater sample results that have been taken in support of the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR). 	3 11 2 6	(contin		Α	
 i. Beginning with the report due within 60 days after January 1, 2007, the Radioactive Effluent Release Report shall include the following information for the previous year: a. A listing with descriptions of any-leaks or spills that have been communicated to State-and Local officials in accordance with the Groundwater Protection INITIATIVE (NEI 07-07). b. Groundwater sample results that have been taken in support of the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR). 	0.11.2.0	(<u>contin</u>	lucu	()	
 a. A listing with descriptions of any-leaks or spills that have been communicated to State-and Local officials in accordance with the Groundwater Protection INITIATIVE (NEI 07-07). b. Groundwater sample results that have been taken in support of the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR). 		i	Beg Rac info	ginning with the report due within 60 days after January 1, 2 dioactive Effluent Release Report shall include_the-following prmation for the previous year:	007, the
 Groundwater sample results that have been taken in support of the Groundwater Protection INITIATIVE (NEI 07-07), unless they are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be reported in the Annual Radiological Environmental Operating Report (AREOR). 	-		a.	A listing with descriptions_of any-leaks or spills that have communicated to State-and Local officials in accordance Groundwater Protection INITIATIVE (NEI 07-07).	e been e with the
			b.	Groundwater sample results that have been taken in sur the Groundwater Protection INITIATIVE (NEI 07-07), un are from locations that are described in the Radiological Environmental Monitoring Program and will therefore be in the Annual Radiological Environmental Operating Rep (AREOR).	pport of less they reported port
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RADIOLOGICAL E	NVIRONMENTAL MONITORING	
<u>3/4.12.1 MON</u>	TORING PROGRAM	
CONTROLS		-
3.12.1 In accord Monitorir	lance with St. Lucie Plant TS 6.8.4.g.1), the Radiologica ig Program shall be conducted as specified in Table 3.1	Il Environmental 2-1.
<u>APPLICABILITY:</u>	At all times.	
ACTION:		
a. With-the Rad specified in Radiological description of plans for pre	diological Environmental Monitoring Program not being of Table 3.12-1, prepare and submit to the Commission, in Environmental Operating Report required by Control 3. of the reasons for not conducting the program as require eventing a recurrence.	conducted as the Annual 12.4, a ed and the
b. With the con environment the reporting prepare and a Special Re defines the co potential and year limit of radionuclide shall be sub	firmed* level of radioactivity as the result of plant effluer al sampling medium at a location specified in Appendix levels of Table 3.12-2 when averaged over any calend submit to the Commission within 30 days, pursuant to F eport*** that identifies the cause(s) for exceeding the lim corrective actions to be taken to reduce radioactive efflu- nual dose** to a MEMBER OF THE PUBLIC is less than Controls 3.11.1.2, 3.11.2.2 or 3.11.2.3. When more tha s in Table 3.12-2 are detected in the sampling medium,- mitted if:	nts in an B-1 exceeding ar quarter, Plant TS 6.9.2, hit(s) and ents so that the the calendar n one of the this report
	$\frac{\text{concentration (1)}}{\text{reporting level (1)}} + \frac{\text{concentration (2)}}{\text{reporting level (2)}} + > \text{ or } = 1.01$	
-		
 A confirmatory i desirable, as ap at the earliest til The methodolog 	reanalysis of the original, a duplicate or a new sample m propriate. The results of the confirmatory analysis shal me consistent with the analysis but in any case within 30 gy and parameters used to estimate the potential annua	nay be I be completed 0 days. I dose to a
MEMBER OF T *** A copy of the 3 Manager (or de of HPP-101 co	HE PUBLIC shall be indicated in this report. O-day Special Report shall be provided to the Radiation esignee) so that it can be sent to State and Local Officia ncurrent with its submittal to the commission.	Protection Is in TABLE-1

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RADIOLOGICAI	ENVIRONMENTAL MONITORING	Service Service
<u>3/4.12.1 M(</u>	NITORING PROGRAM	
Controls (contine	∋d)	
ACTION:		
b. (continue)	
When rac result of p to a MEM the calend required i however, Annual R c. With milk sample lo replacem Environm from whic program. Effluent-F revised fit supportin justifying	bnuclides other than those in Table 3.12-2 are detected ar ant effluents, this report shall be submitted if the potential BER OF THE PUBLIC from all radionuclides is equal to or ar year limits of Control 3.11.1.2, 3.11.2.2 or 3.11.2.3. This the measured level of radioactivity was not the result of pl n such an event, the condition shall be reported and descr diological Environmental Operating Report required by Co or broad leaf vegetation samples unavailable from one or r ations required by Table 3.12-1, identify specific locations nt samples and add them within 30 days to the Radiologic ntal Monitoring Program given in the ODCM. The specific samples were unavailable may then be deleted from the Pursuant to Control 3.11.2.6, submit in the next Annual Ra elease Report documentation for a change in the ODCM ir ure(s) and table for the ODCM reflecting the new location information identifying the cause of the unavailability of same selection of the new location(s) for obtaining samples.	nd are the annual dose, greater than is report is not ant effluents; ibed in the ontrol 3.12.4. nore of the for obtaining al c locations monitoring adioactive ncluding a (s) with amples and
SURVEILLANCI	REQUIREMENTS	
4.12.1 The rad to Tab ODCM the de	ological environmental monitoring samples shall be collec a 3.12-1 from the specific locations given in the table and and shall be analyzed pursuant to the requirements of Ta action capabilities required by Table 4.12-1.	ted pursuant figure(s) in the ble 3.12-1 and

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	RADIO	TABLE OGICAL ENVIRONMEN	3.12-1 TAL MONITORING PI	ROGRAM ^{a)}			
		(Page	1 of 3)				
E>	(POSURE PATHWA and/or SAMPLE	AY REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS ^{b) c)}	SAMPLING AND COLLECTION FREQUENCY ^{d)}	TYPE AND FREQUENCY ^{d)} OF ANALYSIS			
1.	Direct Radiation ^{e)}	27 Monitoring Locations	Continuous monitoring with sample collection quarterly ^{f)}	Gamma exposure rate - quarterly			
2.	Airborne.Radioiodin and Particulates	ne - 5 Locations	Continuous sampler operation with sample collection weekly or more frequently if required by dust loading	Radiciodine filter: I-131 analysis weekiy Particulate Filter: Gross beta radioactivity analysis ≥24 hours following a filter change ^{g)-} Gamma isotopic ^{h)} analysis of composite ^{g)} (by location) quarterly			
3.	Waterborne						
	a. Surface ^{k)}	1 Location ^{m)}	Weekly	Gamma isotopic ^{ny} & tritium analyses weekly			
		1 Location ⁿ⁾	Monthly	Gamma isotopic ^{h)} & tritium analyses monthly			
-	b. Sediment from shoreline	2 Locations	Semiannually	Gamma isotopic ^{h)} analyses semiannually			
4.	Ingestion						
	a. Fish and Invertebrates		-	_			
	1. Crustacea	2 Locations	Semiannually	-Gamma isotopic ^{h)} analyses semiannually			
-	2. Fish	2 Locations	Semiannually	Gamma isotopic ^{h)} analyses semiannually			
	-bFood Products						
	1. Broad leaf vegetation	- 3 ₋ Locations ^{p)}	Monthly when available	Gamma isotopic ^{h)} and I-131 analyses monthly			

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DDOOF	50	OFFSITE DOSE CALCULATION MANUAL (ODCM)	59 of 231				
PROCE	C-200	ST. LUCIE PLANT					
	RADIO	TABLE 3.12-1 OGICAL ENVIRONMENTAL MONITORING PROGR (Page 2 of 3)	<u>AM</u> ^{a)}				
		TABLE NOTATIONS					
a.	Deviations an unobtainable automatic sar unobtainable taken prior to schedule sha Report pursua	permitted from the required sampling schedule if spe lue to hazardous conditions, seasonal unavailability, n pling equipment or other legitimate reasons. If specir lue to sampling equipment malfunction, corrective act he end of the next sampling period. All deviations from be documented in the Annual Radiological Environment nt to Control 3.12.4.	cimens are nalfunction of nens are on shall be m the sampling ental Operating				
ь.	Specific-para reactor and a sample locati	Specific-parameters of distance and direction sector from the centerline of one reactor and additional description where pertinent, shall be provided for each sample location required by Table 3.12-1, in Appendix-B and applicable figures.					
c.	At times, it may not be possible or practicable to continue to obtain samples of the media of choice at the most desired location or time. In these instances suitable alternative media and locations may be chosen for the particular pathway in question and appropriate substitutions made within 30 days in the radiological environmental monitoring program.						
d.	The following definition of frequencies shall apply-to Table 3.12-1 only:						
	Weekly	 - Not less than once per calendar week. A maximum 11 days is allowed between the collection of any two consecutive samples. 	m interval of wo				
	Semi-Monthly	 Not less than 2 times per calendar month-with an induction interval of 24 days is allowed between collection of consecutive samples. 	nterval of A maximum f any two				
	Monthly	 Not less than once per calendar month with an inteless than 10 days between sample collections. 	erval of not				
	Quarterly	- Not less than once per calendar quarter.					
	Semiannually	 One sample each between calendar dates (Janua and (July 1 - December 31). An interval of not less will be provided between sample collections. 	ry 1 - June 30) s than 30 days				
	The frequenc	of analyses is to be consistent with the sample collec	tion frequency.				

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			£			
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ROCE	DURE NO.:	ST LUCIE PLANT				
	RADI	TABLE 3.12-1 OLOGICAL ENVIRONMENTAL MONITORING PROG (Page 3 of 3)	RAM ^{a)}			
		TABLE NOTATIONS (continued)				
. .	One or mor recording d integrating (TLD) is co considered	re instruments, such as a pressurized ion chamber, for i lose rate continuously may be used in place of or in add dosimeters. For purposes of this table, a thermolumine insidered to be one phosphor; two or more phosphors in as two or more dosimeters.	measuring and lition to, escent dosimeter n a packet are			
	Refers to n when cond	ormal collection frequency. More frequent sample-colle itions warrant.	ection is permitted			
] .	Airborne pa or more aft the require also require per cubic m sample.	articulate sample filters are analyzed for gross beta radio er sampling to allow for radon and thoron daughter deca ment for a gamma isotopic on a composite sample a ga ed for each sample having a gross beta radioactivity wh neters and which is also >10 times that of the most rece	oactivity 24 hours ay. In addition to mma isotopic is ich is >1.0 pCi nt control			
٦.	Gamma isotopic analysis means the identification and quantification of gamma- emitting radionuclides that may be attributable to the effluents from the facility.					
۲.	Discharges from the St. Lucie Plant do not influence drinking water or ground water pathways.					
n.	Atlantic Oc Hutchinson	ean, in the vicinity of the public beaches along the east I Island near the St. Lucie Plant (grab sample)	ern shore of			
า.	Atlantic Oc	ean, at a location beyond influence from plant effluents	(grab sample).			
D.	Samples of locations o similar broa leas t preva	f broad leaf vegetation grown nearest each of two different f highest predicted annual average ground level D/Q an ad leaf vegetation at an available location 15-30 kilomet lent wind direction based upon historical data in the OD	ent offsite d one sample of ers distant in the CM.			
i, j, l	(lower case)	and o are not used on notation for clarity reasons]				

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REP	ORTING LEV <u>II</u>	TABLE ELS FOR RADIO N ENVIRONMEN (Page 1	3.12-2 OACTIVITY CO ITAL SAMPLE 1 ⁻ of 1)	DNCENTRATI	ONS	
		REPORTIN	<u>G LEVELS</u>			
ANALYSIS	WATER pCi/l	AIRBORNE PARTICULATE OR GASES pCi/m ³	FISH pCi/kg, wet	MILK pCi/l	FOOD PRODUCTS pCi/kg, wet	
⁻ H-3 ⁻	30,000*	-				
Mn-54	1,000		30,000			
Fe-59	400		10,000			
Co-58	1,000		30,000			
Co-69	300		10,000			
Zn-65	-300		20,000			
Zr- Nb-95***	400					
I-131	2**	0.9		3	100	
Cs-134	30	10	1,000	60	1,000	
Cs-137	50	20	2,000	70	2,000	
Ba- La-140***	200			300		

as in-pCi/i denotes liter -

Since no drinking water pathway exists, a value of 30,000 pCi/l is used. For drinking water samples, a value of 20,000 pCi/l is used; this is 40 CFR Part-141 value.

Applies to drinking water pathway exists, 2 pCi/l is the limit for drinking water.

An equilibrium-mixture of the parent daughter isotopes which corresponds to the *** reporting-value of the parent isotope.

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TABLE 4.12-1 DETECTION CAPABILITIES FOR ENVIRONMENTAL SAMPLE ANALYSIS (1)(2) (Page 1 of 2)

LOWER LIMIT OF DETECTION (LLD)-⁽³⁾

ANALYSIS	WATER pCi/l	AIRBORNE PARTICULATE OR GASES pCi/m ³	FISH pCi/kg, wet	MILK pCi/l	FOCD PRODUCTS pCi/kg, wet	SEDIMENT pCi/kg, dry
Gross Beta	4	0.01			-	
H-3	3000*	-				
Min-54	15		130			
Fe=59	30		260			
Co-58, Co-60	15		130			
Zn-65	30		260			,
Zr-95, Nb-95 ⁽⁴⁾	15					
I-131	1**	0.07		1	60	
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	80	180
Ba-140 , La-140 ⁽⁴⁾	15			15		

* No drinking water pathway exists, a value of 2000 pCi/l is for drinking water.

LLD for drinking water samples. If no drinking water pathway exists, a value of 15 pCi/l may be used.

TABLE NOTATIONS

(1) This list does not mean that only these nuclides are to be considered. Other peaks that are-identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Annual Radiological Environmental Operating Report pursuant to Control 3.12.4.

(2) Required detection capabilities for thermoluminescent dosimeters used for environmental measurements are given in Regulatory Guide 4.13.

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	DETEC	TIO	<u>N C</u>	TABLE 4.12-1 APABILITIES FOR ENVIRONMENTAL SAMPLE AN (Page 2 of 2)	ALYSIS (1)(2)
-				TABLE NOTATIONS (continued)	
(3)	(3) The LLD is defined for purposes of these controls, as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a real signal.				
-	For a	part	icul	ar measurement system, which may include radiochen	nical separation:
ļ				$4.66 S_{b}$	
				$E \bullet V \bullet 2.22 \bullet Y \bullet \exp(-\lambda \bullet \Delta T)$	
\	Where:				-
	LLD	=	the	a priori lower limit of detection (pico-Curie per unit ma	ss or volume),
	S _b = the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (counts per minute),				
	Е	=	the	counting efficiency (counts per disintegration),	
	V	=	the	sample size (units of mass or volume),	
-	2.22	=	the	number of disintegrations per minute per pico-Curie,	
	Ý	Ξ	the	fractional radiochemical yield, when applicable,	
	λ	=	the	radioactive decay constant for the particular radionucl	ide (sec ⁻¹) and
-	ΔΤ	=	the of c	elapsed time between the midpoint of sample collection counting (sec).	on and the time
ר	Typical v	value	es c	of E, V, Y and ΔT should be used in the calculation.	
	It sho repres (after such Occa prese these identi Repo	uld t senti the a ma siona ence tLLD fied rt pu	pe r ing. fact anno ally of in of in and irsu	ecognized that the LLD is defined as an <u>a priori</u> (before the capability of a-measurement system and not as an) limit for a particular measurement. Analyses shall be er that the stated LLDs will be achieved under routine of background fluctuations, unavoidable small sample siz nterfering nuclides or other uncontrollable circumstance inachievable. In such cases, the contributing factors shall described in the Annual Radiological Environmental C ant to Control 3.12.4.	e the fact) limit <u>a posteriori</u> performed in conditions. zes, the es may render nall be operating
(4)	An eo 15 pC	quilib Ci/Lite	oriur er o	n mixture of the parent and daughter isotopes which co of the parent isotope.	prresponds to

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RADIOLOGICAL ENVIRONMENTAL MONITORING

3/4.12.2 LAND USE CENSUS

CONTROLS

3.12.2 In accordance with St. Lucie Plant TS 6.8.4.g.2), a Land Use Census shall be conducted and shall identify within a distance of 8 km (5 miles) the location in each of the 16 meteorological sectors of the nearest milk animal, the nearest residence and the nearest garden* of greater than 50 square meters (500 square feet) producing broad leaf vegetation.

APPLICABILITY: At-all times.

ACTION:

- With a Land Use Census identifying a location(s) that yields a calculated dose or dose commitment greater than the values currently being calculated in Control 4.11.2.3, pursuant to Control 3.11.2.6, identify the new location(s) in the next Annual Radioactive Effluent Release Report.
- b. With a Land Use Census identifying a location(s) that yields a calculated dose or dose commitment (via the same exposure pathway) 20% greater than at a location from which samples are currently being obtained in accordance with Control 3.12.1, add the new location(s) within 30 days to the Radiological Environmental Monitoring Program given in the ODGM. The sampling location(s), excluding the control station location, having the lowest calculated dose or dose commitment(s), via the same exposure pathway, may be deleted from this monitoring program after October 31 of the year in which this Land Use Census was conducted. Pursuant to TS 6.14, submit in the next Annual Radioactive Effluent Release Report documentation for a change in the ODCM including a revised figure(s) and table(s) for the-ODCM reflecting the new location(s) with information supporting the change in sampling locations.

^{*} Broad leaf vegetation sampling may be performed at the SITE BOUNDARY in each of two different direction sectors with the highest predicted D/Qs in lieu of the garden census. Controls for broad leaf vegetation sampling in Table 3.12-1, Part 4.b., shall be followed, including analysis of control samples.

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3/4.12.2 LAND USE CENSUS (continued)

SURVEILLANCE REQUIREMENTS

4.12.2 The Land Use Census shall be conducted during the growing season at least once per 12 months using that information that will provide the best results, such as by a door-to-door survey, aerial survey or by consulting local agriculture authorities. The results of the Land Use Census shall be included in the Annual Radiological Environmental Operating Report pursuant to Control-3.12.4.

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RADIOLOGICAL ENVIRONMENTAL MONITORING

3/4.12.3 INTERLABORATORY COMPARISON PROGRAM

CONTROLS

3.12.3 In accordance with St. Lucie Plant TS 6.8.4.g.3), analyses shall be performed on all radioactive materials, supplied as part of an Interlaboratory Comparison Program that correspond to samples required by Table 3.12-1.

<u>APPLICABILITY:</u> At all times.

ACTION:

a. With analyses not being performed as required above, report the corrective action taken to prevent a recurrence to the Commission in the Annual Radiological Environmental Operating Report pursuant to Control 3.12.4.

SURVEILLANCE REQUIREMENTS

4.12.3 A summary of the results obtained as part of the above required Interlaboratory Comparison Program shall-be included in the Annual Radiological Environmental Operating Report pursuant to Control 3.12.4. If the Interlaboratory Comparison Program is other than_the program conducted by the DOE-Mixed Analyte-Performance Evaluation Program (MAPEP), then_the Interlaboratory Comparison Program shall be described in the ODCM.

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RADIOLOGICAL EN	IVIRONMENTAL MONITORING	
3/4.12.4 ANNU	AL RADIOLOGICAL ENVIRONMENTAL OPERATING	REPORT
<u>(AREC</u> ADMINISTRATIVE (
3.12.4 In accorda Environme previous of shall inclu of the resu the object Appendix The Annual Radiolog interpretations and in environmental surve appropriate, with pre	ance with St. Lucie Plant TS 6.9.1.8, an Annual Radiolo ental Operating Report covering the operation of the un calendar year shall be submitted before May 1 of each y de summaries, interpretations and information based of ults of the Radiological Environmental Monitoring Progra beriod. The material provided in the AREOR shall be c ives outlined below and with Sections IV.B.2, IV.B.3 and I to 10-CFR Part 50. gical Environmental Operating Reports shall include su information based on trend analysis of the results of the illance activities for the report period, including a comp eoperational studies, with operational controls and with illance reports and an assessment of the observed imp	gical it during the year. The report n trend analysis am for the onsistent with d IV.C of mmaries, radiological arison, as previous acts of the
plant operation on the census required by the construction of the census required by the ce	e environment. The reports shall also include the resu Control 3.12.2.	Its of land use
The Annual Radiolog analysis of all radiolog measurements takes and Figures in the C and measurements Technical Position, 1 are not available for explaining the reaso soon as possible-in	gical Environmental Operating Reports shall include the ogical environmental samples and of all environmental in during the period pursuant to the locations specified in DCM, as well as summarized and tabulated results of t in the format of the table in the Radiological Assessment Revision 1, November 1979. In the event that some ind inclusion with the report, the report shall be submitted in s for the missing results. The missing data shall be su	e results of radiation n_the Table these analyses nt Branch lividual results noting and ubmitted as
The Annual-Radiolo the analyses for all s Monitoring Program Appendix B-2.	gical Environmental Operating Report shall also include samples that have been added to the Radiological Envi in support of the Groundwater Protection INITIATIVE (e the results of ronmental NEI 07-07) -
* - A single subn	 nittal may be made for multiple unit station.	

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RADIOLOGICAL EN	VVIRONMENTAL MONITORING
<u>3/4.12.4 ANNU</u> (AREC	AL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT <u>OR)*</u> (continued)
ADMINISTRATIVE	CONTROLS
I he reports shall als environmental moni ocations-keyed to a the results of the Int discussion of all dev all-analyses_in which	so include the following: a summary description of the radiological toring program; at least two legible maps** covering all sampling table giving distances and directions from the centerline of one react rerlaboratory Comparison Program, required by Control 3.12.3; viations from the sampling schedule of Table 3.12-1; and discussion of the LLD required by Table 4.12-1 was not achievable.

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	BASES FOR THE CONTROLS	
	AND	
The BASES Controls in S	<u>NOTE</u> contained in succeeding pages summarize the reasons ection 3.0 and 4.0, but are not part of these Controls.	for the

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INSTRUMENTATIC)N-	
	<u></u>	
BASES		
<u> </u>		<u></u>
<u>3.3.3.9 RADIO</u>	DACTIVE LIQUID EFFLUENT MONITORING INSTRUM	<u>ENTATION</u>
The radioactive liqu applicable, the relea releases of liquid-ef calculated and adju ODCM to ensure th 20. The OPERABIL requirements of Gen <u>3.3.3.10 RADIC</u>	id effluent instrumentation is provided to monitor and co ases of radioactive materials in liquid effluent during actu fluents. The Alarm/Trip Setpoints for these instruments sted in accordance with the methodology and parameter at the alarm/trip will occur prior to exceeding the limits o _ITY and use of this instrumentation is consistent with th neral Design Criteria 60, 63 and 64 of Appendix A to 10 <u>DACTIVE GASEOUS EFFLUENT MONITORING INSTR</u>	ntrol, as ial or potential shall be rs in the f 10 CFR Part e CFR Part 50. RUMENTATION
applicable, the relea potential releases o shall be calculated a the ODCM to ensur 10 CFR Part 20. Th requirements of Ge	ases of radioactive materials in gaseous effluent during a f gaseous effluents. The Alarm/Trip Setpoints for these and adjusted in accordance with the methodology and p e that the alarm/trip will occur prior to exceeding the limi the OPERABILITY and use of this instrumentation is con- neral Design Criteria 60, 63 and 64 of Appendix A to 10	actual or instruments arameters in ts of sistent with the CFR Part 50.
<u> </u>		

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3/4.11 RADIC	ACTIVE EFFLUENTS	
BASES		
3/4.11.1 LIQUIE	DEFFLUENTS	
3/4.11.1.1 CONC	ENTRATION	
levels specified in 10 provides additional a UNRESTRICTED Af objectives of Append limits of 10 CFR=Par based upon the assu (submersion) was co described in Internal This control applies	CFR Part 20, Appendix B, Table 2, Column 2. This lines essurance that the levels of radioactive materials in boo REAS will result in exposures within: (1) the Section II. dix I, 10 CFR Part 50; to a MEMBER OF THE PUBLIC t 20. The concentration limit for dissolved or entrained umption that Xe-135 is the controlling radioisotope and onverted to an equivalent concentration in water using tional Commission on Radiological Protection (ICRP) F	mitation fies of water in A design and (2) the noble gases_is its ECL in air the methods Publication 2.
The required detection abulated in terms of and other detection I Definition and Elabo Environmental Meas Procedures Manual,	on capabilities for radioactive materials in liquid waste f the lower limits of detection (LLDs). Detailed discussi limits can be found in Currie, L.A., Lower Limit of Detect ration of a Proposed Position for Radiological Effluent surements, NUREG/CR-4007 (September 1984) and in <u>HASL-300</u> .	samples are on of the LLD ction: and the HASL
374:11.1.2 _ DOSE		
his control is provide Appendix-1, 10 CFR of Appendix I. The A the same time imple the releases of radio kept as low as is rea supplies that can be assurance that the c the finished drinking The dose calculatior requirements in Sec be shown by calcula exposure of a MEMI	ed to implement the requirements of Sections II.A, III.A Part 50: The Control implements the guides set forth in ACTION statements provide the required operating flex ment the guides set forth in Section IV.A of Appendix I bactive material in liquid effiuents to UNRESTRICTED A isonably achievable. Also, for fresh water sites with dri- potentially affected by plant operations, there is reason operation of the facility will not result in radionuclide cor- water that are in excess of the requirements of 40 CFI in methodology and parameters in the ODCM implemen- tion III.A of Appendix I that conformance with the guide stional procedures based on models and data, such that BER OF THE PUBLIC through appropriate pathways is	and IV.A-of n Section II.A tibility and at to assure that AREAS will be- inking water nable ncentrations in R Part 141. It the so f Appendix I at the actual s unlikely to be

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-		

<u>3/4.11.1 LIQUID EFFLUENTS</u> (Continued)

<u>3/4.11.1.2 DOSE</u> (Continued)

The equations specified in the ODCM for calculating_the doses due to the actual release rates of radioactive materials in liquid effluents are consistent with the methodology provided in Regulatory Guide 1.109, Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix-I, Revision 1, October 1977 and Regulatory Guide 1.113, Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I, April 1977.

This control applies to the release of radioactive materials in liquid effluents from each unit at the site. For units with shared Radwaste Systems, the liquid effluents from the shared system are to be proportioned among the units sharing that system.

3/4.11.1.3 LIQUID RADWASTE TREATMENT SYSTEM

The OPERABILITY of the Liquid Radwaste Treatment System ensures that this system will be available for use whenever liquid effluents require treatment prior to release to the environment. The requirement that the appropriate portions of this system be used when specified provides assurance that the releases of radioactive materials in-liquid effluents will be kept as low as is reasonably achievable. This control implements the requirements of 10 CFR 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50 and the design objective given in Section II.D of Appendix I to 10 CFR Part 50. The specified_limits governing the use of appropriate portions of the Liquid Radwaste Treatment System were specified-as a suitable fraction of the dose design objectives set forth in Section II.A of Appendix I, 10 CFR Part 50 for liquid effluents.

This control applies to the release of radioactive materials in liquid effluents from each unit at the site. For units with shared Radwaste Treatment Systems, the liquid effluents from the shared system are to be proportioned among the units sharing_that system.
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3/4.11.2 GASEOUS EFFLUENTS

3/4.11.2.1 DOSE RATE

This control is provided to ensure that the dose at any time at and beyond the SITE BOUNDARY from gaseous effluents from all units on the site will be within the annual dose limits of 10 CFR Part 20 to UNRESTRICTED AREAS. The annual dose limits are the doses associated with the concentration of 10 CFR Part 20. Appendix B. Table 2. Column I. These limits provide reasonable assurance that radioactive material discharged in gaseous effluents will not result in the exposure of a MEMBER OF THE PUBLIC in an UNRESTRICTED AREA, either within or outside the SITE BOUNDARY, to an annual average concentration exceeding the limits specified in Appendix B, Table 2 of 10 CFR Part 20 (Subpart D of 10 CFR Part 20). For MEMBERS OF_THE_PUBLIC who may at times be within the SITE BOUNDARY, the occupancy of that MEMBER OF THE PUBLIC will usually be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the SITE BOUNDARY. The specified release rate limits restrict, at all times, the corresponding gamma and beta dose rates above background to a MEMBER OF THE PUBLIC at or beyond the SITE BOUNDARY to less than or equal to 590 mrems/year to the total body or to less than or equal to 3000 mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background to a child via the inhalation pathway to less than or equal to 1500 mrems/year.

This control applies to the release of radioactive materials in gaseous effluents from all units at the site.

The required detection capabilities for radioactive materials in gaseous waste samples are tabulated in terms of the lower limits of detection (LLDs). Detailed discussion of the LLD and other detection limits can be found in Currie, L. A., Lower Limit of Detection: Definition and Elaboration of a Proposed Position for Radiological Effluent and Environmental Measurements, NUREG/CR-4007-(September 1984) and in the HASL Procedures Manual, <u>HASL-300</u>.

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3/4.11.2.1 DOSE - NOBLE GASES

This control is provided to implement the requirements of Sections II.B, III.A and IV.A of Appendix I, 10 CFR Part 50. The control implements the guides set forth in Section I.B of Appendix I. The ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in gaseous effluents to UNRESTRICTED AREAS will be kept as low as is reasonably achievable. The Surveillance Requirements implement the requirements in Section III. A of Appendix I that conformance with the guides of Appendix-I be shown by calculational procedures based on models and data such that the actual exposure of a MEMBER OF THE PUBLIC through appropriate pathways is unlikely to be substantially underestimated. The dose calculation methodology and parameters established in the ODCM for calculating the doses due to the actual_release-rates of radioactive noble gases in gaseous effluents are consistent with the methodology provided in Regulatory Guide 1.109, Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, Revision 1, October 1977 and Regulatory Guide 1.111, Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water Cooled Reactors, Revision 1, July 1977, The ODCM equations provided for determining the air doses at and beyond the SITE BOUNDARY are based upon the historical average atmospheric conditions.

This control applies to the release of radioactive materials in gaseous effluents from each unit at the site. For units with shared Radwaste Treatment Systems, the gaseous effluents from the shared system are to be proportioned among the units sharing that system.

3/4.11.2.3 DOSE - IODINE-131, IODINE-133, TRITIUM AND RADIOACTIVE MATERIAL IN PARTICULATE FORM

This control is provided to implement the requirements of Sections-II.C, III.A and IV-A of Appendix I, 10 CFR Part 50. The Controls are the guides set forth in Section II-C of Appendix I. The ACTION statements provide the required operating flexibility and-at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in gaseous effluents to UNRESTRICTED AREAS will be kept as low as is reasonably achievable. The ODCM calculational methods specified in the Surveillance Requirements implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data such that the actual exposure of a MEMBER OF THE PUBLIC through appropriate pathways is unlikely to be substantially underestimated.

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3/4:11.2.1 DOSE - NOBLE GASES (Continued)

3/4.11.2.3 DOSE - IODINE-131, IODINE-133, TRITIUM AND RADIOACTIVE MATERIAL IN-PARTICULATE FORM (Continued)

The ODCM calculational methodology and parameters for calculating the doses due to the actual release rates of the subject material are consistent with the methodology provided in Regulatory Guide 1.109, Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, Revision 1, October 1977 and Regulatory Guide 1.111, Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water Cooled Reactors, Revision 1, July 1977. These equations also provide for determining the actual doses based upon the historical average atmospheric conditions. The release rate controls for lodine-131, lodine-133, tritium and radionuclides in particulate form with half-lives greater than 8 days are dependent upon the existing radionuclide pathways to man in the areas at and beyond the SITE BOUNDARY. The pathways that were examined in the development of the calculations were: (1) individual inhalation of airborne radionuclides, (2) deposition of radionuclides onto green leafy vegetation with subsequent consumption by man, (3) deposition onto grassy-areas where milk animals and meat producing animals graze with consumption of the milk and meat by man and (4) deposition on the ground with subsequent exposure of man.

This control applies to the release of radioactive materials in gaseous effluents from each unit at the site. For units with shared Radwaste Treatment Systems, the gaseous effluents from the shared-system are proportioned among the units sharing that system.

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3/4.11.2.4 GASE	EOUS RADWASTE TREATMENT SYSTEM	
EXHAUST TREAT whenever gaseous requirement that th provides reasonabl effluents will be kep requirements of 10 10 CFR Part 50 an Part 50. The speci were specified as a and II.C of Append	MENT SYSTEM ensure that the systems will be availab effluents require treatment prior to release to the enviro e appropriate portions of these systems be used, when e assurance that the releases of radioactive materials in ot as low as is reasonably achievable. This control imple CFR 50.36a, General Design Criterion 60 of Appendix d the design-objective given in Section II.D of Appendix fied limits governing the use of appropriate portions of the suitable fraction of the dose design objectives set forth ix I, 10 CFR Part 50 for gaseous effluents.	le for use onment. The specified, n gaseous ements the A to I to 10 CFR he systems in Section II.B
This control applies unit at the site. For effluents from the s	to the release of radioactive materials in gaseous efflue units with shared Radwaste Treatment Systems, the gather hared system are proportioned among the units sharing	ents from each aseous g that system.
<u>3/4.11.2.5 NOT</u>	USED	
3/4.11.2.6 NOT	USED	

<u>3/4.11.4 TOTAL DOSE</u>

This control is provided to meet the dose limitations of 10 CFR Part 190 that have been incorporated into 10 CFR Part 20 by 46 FR 18525. The control requires the preparation and submittal of a Special Report whenever the calculated doses due to releases of radioactivity and to radiation from uranium fuel cycle sources exceed 25 mrems to the whole body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrems. For sites containing up to four reactors, it is highly unlikely that the resultant dose to a MEMBER OF THE PUBLIC will exceed the dose limits of 40 CFR Part 190 if the individual reactors remain within twice the dose design objectives of Appendix I, and if direct radiation doses from the units (including outside storage tanks, etc.) are kept small. The Special Report will describe a course of action that should result in the limitation of the annual dose to a MEMBER OF THE PUBLIC to within the 40 CFR Part 190 limits.

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3/4.11.4 TOTAL DOSE (Continued)

For the purposes of the Special Report, it may be assumed that the dose commitment to the MEMBER OF THE PUBLIC from other uranium fuel cycle sources is negligible, with the exception that dose contributions from other nuclear fuel cycle facilities at the same site or within a radius of 8 kilometers must-be considered. If the dose to any MEMBER OF THE PUBLIC is estimated to exceed the requirements of 40 CFR Part 190, the Special Report with a request for a variance (provided the release conditions resulting in violation of 40 CFR Part 190 have not already been corrected), in accordance with the provisions of 40 CFR 190.11 and Subpart M of 10 CFR Part 20, is considered to be a timely-request and fulfills the requirements of 40 CFR Part 190 until NRC staff action is completed. The variance only relates to the limits of 40 CFR Part 20, as addressed in Controls 3.11.1.1 and 3.11.2.1. An individual is not considered a MEMBER OF THE PUBLIC during any period in which he/she is engaged in carrying out any operation that is part of the nuclear fuel cycle.

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3/4.12.1 MONITORING PROGRAM

The Radiological Environmental Monitoring Program required by this control provides representative measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides that lead to the highest potential radiation exposure of MEMBERS OF THE PUBLIC resulting from the plant operation. This monitoring program implements Section IV.B.2 of Appendix I to 10-CFR Part 50 and thereby supplements the Radiological Effluent Monitoring Program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and the modeling of the environmental exposure pathways. Guidance for this monitoring program is provided by the Radiological Assessment Branch Technical Position on Environmental Monitoring, Revision 1, November 1979. The initially specified monitoring program will be effective for at least the first three years of commercial operation. Following this period, program changes may be initiated based on operational experience.

The required detection capabilities for environmental sample analyses are tabulated in terms of the lower limits of detection (LLDs). The LLDs required by Table 4.12-1 are considered optimum for routine environmental measurements in industrial laboratories. It should be recognized that the LLD is defined as an <u>a priori</u> (before the fact) limit representing the capability of a measurement system and not as an <u>a posteriori</u> (after the fact) limit for a particular measurement.

Detailed discussion of the LLD and other detection limits can be found in Currie, L. A., Lower Limit of Detection: Definition and Elaboration of a Proposed Position for Radiological Effluent and Environmental Measurements, NUREG/CR-4007 (September 1984) and in the HASL Procedures Manual, <u>HASL-300</u>.

3/4.12.2 LAND USE CENS⊎S

This control is provided to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that-modifications to the Radiological Environmental Monitoring Program given in the ODCM are made if required by the results of this census. The best information from the door-to-door survey, from aerial survey or from consulting with local agricultural authorities shall be used.

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3/4.12.2 LAND USE CENSUS (Continued)

This census satisfies the requirements of Section IV:B.3 of Appendix I to 10 CFR Part 50. Restricting the census to gardens of greater than 50 square meters provides assurance that significant exposure pathways via leafy vegetables will be identified and monitored since a-garden of this size is the minimum required to produce the quantity (26 kilograms/year) of leafy vegetables assumed in Regulatory Guide-1.109 for consumption by a child. To determine this minimum garden size, the following assumptions were made:_(1) 20% of the garden was used for growing broad leaf vegetation (i.e., similar to lettuce and cabbage) and (2)-a vegetation-yield of 2 kilograms per square meter.

3/4.12.3 INTERLABORATORY COMPARISON PROGRAM

This requirement for participation in an approved Interlaboratory Comparison Program is provided to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring in order to demonstrate that the results are valid for the purposes of Section IV.B.2 of Appendix I to 10 CFR Part 50.

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<u>GLOSS/</u>	ARY	METHODOLOGY SECTION OF COMMONLY USED TERMS IN METHODOLOGY (Page 1 of 3)	SECTION
- D _B	-	Dose from Beta Radiation	
CC or cc	-	Cubic centimeter	
Ci	-	Curies - a unit of radioactivity see μ Ci	_
Ci	-	Activity or concentration of a nuclide in the release sour of μ Ci, μ Ci/cc or μ Ci/ml	irce. Units
CFR	-	Code of Federal Regulations	
Control(s)	-	Regulations for operating, controlling, monitoring and r radioactive effluent related activity as indicated by the Section of the ODCM.	eporting Controls
Dose	-	The exposure, in mrem or mrad, the organ or the individual receives from radioactive effluents	
Dose Factor	-	Normally, a factor that converts the effect of ingesting material into the body, to dose to a specific organ. Bot radioactive decay and organ uptake are some of the fadetermine a dose factor for a given nuclide	radioactive dy elimination, actors that
Dose Pathway	-	A specific path that radioactive material physically trav prior to-exposing an individual to radiation. The Grass Infant is a dose pathway	els through -Cow-Milk-
Dose Rate	-	The dose-received per unit⁻time	
(D/Q) -		-A long term D over Q ₋ - a factor with units of 1/m ² which deposition of particulate matter from a plume at a point from the source. It can be thought of as what part of th going to fallout and deposit over one square meter of g (See Appendix C).	n describes the t downrange ne cloud is ground.
ECL	-	Effluent Concentration Limit	
FUSAR	-	Final Updated Safety Analysis Report.	
Y	-	A gamma photon - The dose from Gammas in air, etc.	

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<u>GLOSS/</u>	ARY	METHODOLOGY SECTION OF COMMONLY USED TERMS IN METHODOLOGY SECTION (Page 2 of 3)
Ground Plane	-	Radioactive material deposited uniformly over the ground emits radiation that produces an exposure pathway-when an individual is standing, sitting, etc., in the area. It is assumed that an adult receives the same exposure as an infant, regardless of the physical height differences. Only the whole body is considered for the ODCM.
H-3	-	Hydrogen-3 or Tritium, a weak Beta emitter
&8DP	-	Radioiodines and particulates with half-lives greater than 8 days
m ³	-	Cubic Meters
m ²	-	Square Meters
nuclide	* <u>_</u>	For the purposes of this manual, a radioactive isotope. Nuclide (i) signifies a specific nuclide, the 1st, 2nd, 3rd one under consideration. If nuclide (i) is I-131, then the Mi (dose factor) under consideration should be M_{I-131} for example.
Organ	-	For the ODCM either the bone, liver, thyroid, kidney, lung, GI-LLI or the Whole Body. Whole Body is considered an organ for ease of writing the methodology in the ODCM.
pCi	-	1⁻pico-Curie = 1.E-12 Curies.
(Q Dot) _i	-	(Q Dot) _i - Denotes a release rate in μ Ci/sec for nuclide (i).
Qi	-	Denotes μ Ci of nuclide (i) released over a specified time interval.
Radioiodines	-	lodine-131 and lodine I-133 for gaseous release pathways.
Receptor	-	The individual receiving the exposure in a given location or who ingests food products from an animal for example. A receptor can receive dose from one or more pathways.
Release Sourc	e(s)	 A subsystem, tank or vent where radioactive material can be released independently of other radioactive release points.
TS		- The St. Lucie Plant Standard Technical Specifications
Total Body		- Same as Whole Body in Control Statements
μCi		- micro Curies. 1 μ Ci = 10 ⁻⁶ Curies. The μ Ci is the standard unit of radioactivity for all dose calculations in the ODCM.

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GLOSSARY	METHODOLOGY SECTION OF COMMONLY USED TERMS IN METHODOLOGY SECTION (Page 3 of 3)
(X/Q)	 A long term Chi over Q. It describes the physical dispersion characteristics of a semi-infinite cloud of noble gases as the cloud traverses downrange from the release point. Since Noble Gases are inert, they do not tend to settle out on the ground. (See Appendix C).
(X/Q) _D	 A long term Depleted Chi⁻over Q. It describes the physical dispersion characteristics of a semi-infinite cloud of radioactive iodines and particulates as the cloud travels downrange. Since lodines and particulates tend to settle out (fallout of the cloud) on the ground, the (X/Q)_D represents what physically remains of the cloud and its dispersion qualities at a given location downrange from the release point. (See Appendix C).
dt, ∆t or delta t	 A specific delta time interval that corresponds with the release interval data etc.
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1.0	LIQUID RELE	EASES METHODOLOGY	-
1.1	Radioactive L	iquid Effluent Model Assumptions	
-	The FUSAR of description the	contains the official description of the site characteristic at follows is a brief summary for dose calculation purpo	es. The oses:
	The-St Atlantic Norma Circula approx for sub of radic wind a are sur and no There	Lucie Plant is located on an island surrounded on two c Ocean and the Indian River, an estuary of the Atlantic ly, all radioactive liquid releases enter the Atlantic Oce ting Water Discharge Pipe terminates on the ocean flo imately 1200 feet offshore (Figure 1-1 Point "L"). No c sequent mixing of the discharge flume with the ocean. Discussed the ocean is dependent on the cor- nd some eddy currents caused by the Gulf Stream. The ficiently random enough to distribute the discharges of concentrating effects are assumed.	o sides by the c Ocean. ean where the for at a point redit is taken The diffusion- nditions of tide, ne_conditions ver a wide area
	or sour Indian to prov Water No rad the Int discha source constru second that wo descrip	th private property boundary lines. The Big Mud Creek River) does connect to a normally locked shut dam, that ide an emergency supply of circulating water to the Int Canal in the event a Hurricane causes blockage of the ioactive water from plant systems could be discharged ake Cooling Water Canal because all plant piping is rou- rge canal and no back flow can occur. However, dilute is from such outfalls as the industrial wastewater system action dewatering may be pumped to the Intake Canal. dary sources would be secured under the extraordinary build precede opening the dam. Consult the FUSAR for otion of characteristics of the water bodies surrounding	a (part of the at is intended ake Cooling Intake Canal. directly into uted to the e secondary m and These conditions r a detailed the-plant site.
	Oīnly th consid	nese nuclides that appear in the Liquid Dose Factor Ta ered for dose calculation.	bles will be

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1.2	Determ	inina i	the Fraction F of 10 CFR Part 20 ECLs ↓imits for A Liqu	uid Release		
	Source	<u>in ning</u>				
	Discussion - Control 3.11.1.1 requires that the sampling and analysis results of liquid waste (prior to discharge) be used with calculation methods in the in-plant procedures to assure that the concentration of liquid radioactive material in the unrestricted areas will not exceed ten times the concentrations specified in 10 CFF Part 20, Appendix B, Table=2. CY-SL=102-0104, Processing Aerated Liquid Waste provides instruction for ensuring batch release tanks will be sampled after adequate mixing. This section presents the calculation method to be used for this determination. This method only addresses the calculation for a specific release source. The in-plant procedures will provide instructions for determining that the summation of each release source's F values do not exceed the site's 10 CFR Par 20 ECL. The values for release rate, dilution rate, etc., will also have to be					
			$F_{L} = \frac{R}{D} \sum_{i=1}^{n} \frac{C_{i}}{(ECL)_{i}}$			
	Where:					
-	FL	=— tl s	he fraction of 10 CFR Part 20 ECL that would result if the ource was_discharged under the conditions specified.	ne release		
	R	=_ T L S L	he undiluted release rate in gpm of the release source. iquid Rad Waste = 170 gpm for Waste Monitor Tank Steam Generator = 125 gpm/Steam Generator iquid Rad Waste = 60 gpm for AWST #2 iquid Rad Waste = 60 gpm for Laundry Drain Pumps 2	- A/2B		
	D-	= T F II C	The dilution flow in gpm of Intake Cooling Water or Circu Pumps ntake Cooling flow is 14,500 gpm/pump Circulating Water flow is 121,000 gpm/pump	ulating Water		
	Ċi	= T	he undiluted concentration of nuclide (i) in μ Ci/ml from	sample assay		
	(ECL) _i	= T F fo	The Effluent Concentration Limit of nuclide (i) in μ Ci/ml for dissolved or entrained noble gases the ECL value is or the sum of all gases.	rom Table L-1. 2 X 10 ⁻⁴ μCi/ml		

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1.2	<u>Deter</u> Sourc	<u>mining t</u> ce (conti	he Fraction F of 10 CFR Part 20 ECLs Limits for A Liqu nued)	uid Release
-	The finuclic cumu 3 X 10 cumu gross conce calcul The fo fractic	raction of de-by-nu- lative ac 0 ⁻⁸ µCi/r lative co concentration lation is ollowing on.	of the 10 CFR Part 20 ECL limit may be determined by clide evaluation or for purposes of simplifying the calculativity evaluation. If the simplified method is used, the value of a concentration (sum of all identified radionuclide concentration (sum of all identified radionuclide concentration should be substituted for C _i . As long as the dilu (C _{total} R/D) is less than 3 X 10 ⁻⁸ μ Ci/ml, the nuclide-by not required to demonstrate compliance with the 10 CF section provides a step-by-step procedure for determined	a Ilation by a value of CL) _i and the ations) or the ted nuclide R Part 20 ECL. hing the ECL
	1.	Calcul	ation Process for Selids	
		А.	Obtain from the in-plant procedures, the release rate v gpm for the release source.	alue (R) in
		В.	Obtain from the in-plant procedures, the dilution rate (I credit is taken for any dilution beyond the discharge ca	D) in gpm. No mal flow.
-		С.	Obtain-(C _i), the undiluted assay value of nuclide (i), in simplified method is used, the cumulative concentratio used.	μCi/ml. If the n (C _{total}) is
	-	D	From Table L-1, obtain the corresponding (ECL) for nu μ Ci/ml. The value of 3 X 10 ⁻⁸ μ Ci/ml should be used for method.	iclide (i) in or the simplified
		E.	Divide C _i by (ECL) _i and write down the quotient	
		F.	If the simplified method is used, proceed to the next st determining the ECL fraction by the nuclide-by-nuclide repeat steps 1.2.1.C through 1.2.1.E for each nuclide r assay, for H_3 from previous month composite and for S Fe55 from previous quarter composite with known rest	epIf evaluation, reported in the SR89/90 and ults.

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			METHODOLOGY SECTION	
1.2	<u>Deterr</u> Sourc	<u>mining t</u> <u>e</u> (conti	the Fraction F of 10 CFR Part 20 ECLs Limits for A Liqu nued)	iid Release
-	1.	Calcul	ation-Process for Solids (continued)	
		G.	Add each C _i /(ECL) quotient from step 1.2.1.E and solve follows:	e for F _{L⁻} as
-			$F_{L} = \frac{R}{D} \sum_{i=1}^{n} \frac{C_{i}}{(ECL)i}$	
-			$F_L = a_unit$ -less value where:	
			the value of F_L could be \leq or >1. The purpose of the cardetermine what the initial value of F_L is for a given set conditions.	alculation is to of release
		H.	The F_L value just obtained is for one release pathway. ODCM control 3.11.1.1 allow for a site limit of F_L less the 10. Chemistry Procedure CY-SL-102-0104 administration each pathway's allocation. Compare your F_L result with administrative control for the release pathway in CY-SL	The TS and nan or equal tively controls h the 102-0104.
	2.	Calcul	ation Process for Gases in Liquid	
		A.	Sum the μ Ci/ml of each noble gas activity reported in the function of the second se	ne release.
-		B.	The values of R and D from 1.2.1 above shall be used calculations below:	in the
-			$F_g = \frac{(\text{sum of 1.2.2.A}) \mu \text{Ci/ml}}{1} X \frac{R}{D}$	
		C.	F_g shall be less than 2 X 10 ⁻⁴ µCi/ml for the site for all r progress. Each release point will be administratively c	eleases in ontrolled.

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_	METHODOLOGY SECTION	
1.3 <u>Determining</u>	Setpoints for Radioactive Liquid Effluent Monitors	
1.3.1 Setpoi 301 or Batch	nts for Batch Liquid Release Monitors channel numbers n Table 3.3-14, Radioactive Effluent Monitor Setpoint Ba Liquid Effluent Monitors.	s R6627 and asis, are the
<u>Discussion</u> - instrumentati radioactivity concentration liquid effluent	Control 3.3.3.9 requires that the liquid effluent monitorir on alarm / trip setpoints be set to initiate an alarm or trip concentration in water in the unrestricted area does not of 10 CFR Part 20, Appendix B, Table 2 as a result of ts (Control 3.11.1.1).	ng⊥ o so that the exceed the radioactivity in
Gross cpm v Monitors bas gross cpm ar in the dischal reports was u These conce discharge ca 121,000 gpm nuclide's resp on the table t	s. total liquid activity-curves are available for Batch Liqued on a composite of real release data. A direct correlated the concentrations that would achieve 10 CFR Part 2 rge canal can be estimated. The 1978 liquid release data used to determine the average undiluted release concern trations were then projected to a diluted concentration nal assuming a 1 gpm release rate and a constant diluted from 1 circ. water pump. This diluted activity was divid bective 10 CFR Part 20 ECL value (Table L-1) to obtain that follows:	id-Effluent ation₌between © ECL levels ita from annual ntration. in the ion flow of led by the the Mi column
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1.3 <u>Determini</u>	ng Setpoints f	or Radioactive Liquid Effluent	Monitors (continued)
NUCLIDE	SYMBOL	1978 UNDILUTED uCi/ml ¹	M ² (no units)
[-"	131	4.43 E-5	3.66 E-4
I	132	2 23 E-7	1.84 E-8
	133	3.17 E-6	3.74 E-6
	135	1.31 E-6	3.61 E-7
Na	-24	1.72 E-7	2.84 E-8
Cr	-51	2.51 E-5	4.15.E-7
Mr	n-54	5.64 E-6	1.55 E-6
Mr	n-56	1.11 E-9	1.31 E-10
Cc	o-57	3_69 E-7	5.08 E-8
Co	o-58	1.51 E-4	6.24 E-5
 Fε	e-59	2.92 E-6	2.41 E-6
Co	-60	3.66_E-5	1.01 E-4
Zr	n-65	4.55 E-7	7.52 E-7
Ni	-65	8.23 E-7	6.8 E-8
Ag	-110	1.96 E-6	2.70 E-6
Sn	-113	5.75 E-7	1.58 E-7
Sb	-122	2.15 E-6	1.78 E-6
Sb	-124	8.40 E-6	9.92 E-6
W-	-187	3.51 E-6	9.67 E-7
Np	-239	1.57 E-7	6.49 E-8
Br	-82	3.64 E-7	7.52 E-8
Zr	-95	2.82 E-5	1.17 E-5
Zr	-97	4.05 E-6	3.72 E-6
Mo	p-99	3.24 E-6	1.34 E-6
Ru	-103	3.84 E-8	1.06 E-8
Sb	-125	2.26 ⁻ E-6	6.23 E-7
Cs	-134	2.14 E-5	1.97 E-4
Cs	-136	7.82 E-7	-1.08 E-6
Cs	-137	4.85 E-5	4.01 E-4
Ba	-140	6.44 E-7	6.65 E-7
Ce	-141	3.04 E-8	8.38 E-9
Ce	-144	2.37 E-6	6.53 E-6
A	tot=	4.01 E-4	
M	Total =		1.18 E-3

(1) 1978 Undiluted Release Volume = 7 E 9 ml.

(2)

 $M_{i} = \frac{1978 \text{ Undil. Act Nuclide (i)}}{\text{ECL}_{i} \text{ (from Table L - 1)}} \times \frac{1 \text{ gpm (release rate)}}{121000 \text{ gpm (dil rate)}}$

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ROCE	DURE NO.: C-200		ST. LUCIE PLANT					
			METHODOLOGI SECTION					
.3	<u>Detern</u>	nining S	Setpoints for Radioactive Liquid Effluent Monitors (cont	inued)				
	A _{Tot} is the fra A _{Tot} by equiva discha Site Li	the tota ction of M _{Tot} yi lent to rges. ∃ mit is 1	al average μ Ci/ml concentration of the reference mixtur f the MPC of all-nuclides for the release-conditions spe- ields A _{Max} , which is the maximum total activity concentr the ECL limit for the nuclide distribution typical of radw The Technical Specifications allow 10 times the ECL lin 0 times A _{Max} as follows:	e and M _{⊺ot} is cified. Dividing ation aste nit where∃the				
		A	$_{Max} = \frac{1}{M_{Tot^{-}}} = \frac{1}{1.18 \text{ E} - 3} = 0.34 \mu\text{Ci/ml} = \text{ECL Limit}$					
	Site Limit = 10 x A _{Max} = 10 x 0.34 = 3.4 µCi/ml							
	To pro as follo	vide co ows:	onservative administrative control, A_{Max} of 0.34 μ Ci/ml s	hould be used				
	1.	If the e cpm sh radioad	effluent monitor requires counts per minute units, a (C_{max} nould be obtained for the A_{max} (0.34 µCi/ml) from the rective liquid effluent monitor curve of cpm vs. µCi/ml.	_{ax}) value in lease sources				
-	This so flow.	etpoint	NOTE is for a specified release of 1-gpm into 121000 gpm dil	ution				
	2.	For est (or C _{ma} (i.e., ac contrib	tablishing the setpoint prior to liquid radwaste discharge ax) will be adjusted as needed to account for actual rele ctual design maximum discharge flow rate, dilution flow pution of dissolved and entrained Nobles Gas Activity to	es, the A _{max} ease conditions / rate and the o the Monitor				

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		METHODOLOGY SECTION	
1:3	Determining	Setpoints for Radioactive Liquid Effluent Monitors (cont	inued)
	1.3.2 Setp	pints for Continuous Liquid Release Monitors	
	Discu Moni Gene Read exist Site I be ba with ODC fracti contr rema for so there admi	ission - The activity mixture described-in 1.3.1 for Liquid fors cannot be used for Continuous Liquid Pathways sine rator (S/G) Blowdown Secondary Side is-subject to wha tor Coolant System (RCS) activity and-primary-to-secon- at any time. Although S/G blowdown is not normally alig- liquid Radwaste Release Point (Figure 1-1), the monitor used on the ODCM-maximum design S/G blowdown rate 1 Circulating_Water Pump (CWP) 121,000 gpm in operat M and CY-SL-102-0104, Processing Liquid Waste assur- on-of solids entering the Discharge Canal to the site rele- olled less than or equal to 1.0, with batch release using 8 ining 20% allocated to continuous sources on site. The olids is 10 times the concentration specified in 10 CFR P fore a conservation factor of 10 is already included in the nistrative site limit.	Batch-Release ce the Steam t the current dary leakage gned to the setpoints will of 125 gpm ion- The ne-that the ase point are 30% and the actual site limit art 20,
	Since moni cana (F _L) a Disso gase	e source in-leakage to a S/G cannot be controlled, a High tor setpoint is calculated based on one S/G releasing to at design blowdown rate while attaining the 20 ⁻ percent assuming all the gross solid activity is I-131. The contrib olved and Entrained Gases is assumed to-be zero with a ous activity going to the Steam Condenser and Air Eject	n alarm the discharge of the site limit ution from Il of the or pathway.
	F _L at	20% = <u>0:2⁻</u> = <u>Design blowdown rate</u> x <u>I-131 uCi/m</u> 1 1 CWP Dilution rate I-131 uCi/ml (Tab	<u>I (S/G)</u> le L-1ECL)
	F∟at	20% = <u>0.2</u> = <u>125 gal/min</u> x <u>I-131 uCi/ml (S/</u> 1 121,000 gal/min 1.E-06 uCi/ml (I-131 Tab	<u>G)</u> le L-1ECL <u>)</u>
	Solvi	ng for the S/G High Alarm Setpoint I-131 Activity,	
	l- th di	131 uCi/ml (S/G) = ~2E-04 - uCi/ml I-131 is the maximum at could be allowed such that 20 percent of the administ scharge canal limit would not be exceeded.	s/G activity rative
	This using	S/G Monitor High Alarm Setpoint activity may be convert Liquid Monitor uC/ml to cpm conversion constants.	ed to cpm
	This facto purpo that i 20 ga	Setpoint is conservative given that the actual Liquid Site r of ten times higher than the administrative limit used fo oses, that I-131's ECL is conservative vs other isotope m t is unlikely that more than one S/G would be allowed to allon per day primary-to-secondary leak rate.	Limit is a r calculation ixtures, and operate with a

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			METHODOLOGY SECTION	
1.4 <u>Detern</u>	nining t	he Do	ose for Radioactive Liquid Releases	
<u>Discus</u> 31 day excess caiend any or be use	sion - (s to ve of 1.5 ar qua gan du d for th	Contro rify th mrer rter au ring a nis ve	ol 3.11.1.2 requires calculations be performed at at cumulative radioactive liquid effluents do not c n to the whole body and 5 mrem to any organ du nd not in excess of 3 mrem to the whole body and ny calendar year. This section presents calculati rification.	least once per ause a dose in ing any 1 10 mrem to onal method to
This m		is bas	ed on the methodology suggested by sections 4.	3 and 4.3.1 of
both th	e fish	and s	hellfish pathways so that the fish-shellfish pathwa	y is the only
pathwa can_als are [_] us	ay for y so be c ed for f	vhich alcula he or	dose will be calculated. The dose for adult, child ated by this method provided that their appropriate gan of interest. An infant is excluded from Liquid	and-teenager e dose factors Dose Pathway
at St. I which 3.11.2 consid	₋ucie s age gro .6.c). (ered.	ince t oup is Only t	hey do not eat fish-shellfish. The effluent supervision to the controlling (most restrictive) age group-(see hose nuclides that appear in the Tables of this matrix	sor will track control anual will be
- 1.	This m for a g time in	iven a iven a iterva	d provides for a dose calculation to the whole bod age group based on real release conditions during I for radioactive liquid release sources. The equa	y or any organ g a specified tion is:
	Where	:		
	D _{1T}		$D_{1T} = \frac{A_{iT} dt_4 Q_{i1}}{(DF)_1}$	
		=	dose commitment in mrem received by organ T (to be specified) during the release time interval	of age group dt ₁ .
	A _{iT-}	=	the composite dose factor for the fish-shellfish p nuclide (i) for organ T of age group (to be specif values listed in the Tables in this manual are ind any site specific information and have the units	athway for ied). The A _{iT} ependent of
			mrem - ml µCi - hr	
	dt ₁	Ξ	the number of hours that the release occurs.	
	Q _{il}	=	The total quantity of nuclide (i) release during dt	₁ (μCi)
	(DF) ₁	=	The total volume of dilution that occurred during time period dt_1 (i.e., the circulating water flow tin	the release nes time)

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			METHODO	DLOGY SECTION	
1.4	<u>Deter</u>	mining	<u>the Dose for Radioacti</u>	ve-Liquid Releases (continued)	
	1.	(contir	ued)		
		The do the cu releas	oses associated with e mulative dose over a c e during a 31 day peri	ach release may then be summe lesired time period (e.g., sum all od, calendar quarter or a year).	ed to provide doses for
				$_{\text{tal}_{T}} = \Sigma D_{1T}$	
		Where	2		
		$D_{T\bar{T}}$	the total dose of during the desir	commitment to organ $_{T}$ due to all red time interval (mrem)	releases
				NOTE	-
			le 1.4 may be used for	r compliing the dose accounting.	
		A.	Determine the time in For once per 31 day of month's hours.	terval dt _l in hours that the release lose calculations dt _l would be for	e took place. the entire
			For quarterly dose ca and for annual dose c required, dt _l may be h a batch release.	lculations dt _l would be the hours- alculations dt _l wo ul d be the hours lours of duration of a single relea	in the quarter, s in the year. If se to evaluate
		B. Obtain (DF) _l for the time period dt _l from Liquid Waste Records for the release source(s) of interest.			
		В.	Obtain (DF) _l for the tin Records for the releas	me period dt _i from Liquid Waste M se source(s) of interest.	Management
		В. С.	Obtain (DF) _i for the til Records for the release Obtain Q _i for nuclide (Management Records	me period dt _i from Liquid Waste I se source(s) of interest. (i) for the time period dt ₁ from the s	Management
		В. С. D.	Obtain (DF) _i for the til Records for the release Obtain Q _i for nuclide (Management Records Obtain A _{iT} from the ap	me period dt _i from Liquid Waste I se source(s) of interest. (i) for the time period dt ₁ from the s opropriate Liquid Dose Factor Ta	Management e Liquid Waste ble
		В. С. D.	Obtain (DF) _i for the til Records for the release Obtain Q _i for nuclide (Management Records Obtain A _{iT} from the ap Age Group	me period dt _i from Liquid Waste I se source(s) of interest. (i) for the time period dt ₁ from the s opropriate Liquid Dose Factor Ta Dose Factor Table	Management
		В. С. D.	Obtain (DF) _I for the til Records for the release Obtain Q _i for nuclide (Management Records Obtain A _{iT} from the ap Age Group Infant	me period dt _i from Liquid Waste N se source(s) of interest. (i) for the time period dt ₁ from the s opropriate Liquid Dose Factor Ta <u>Dose Factor Table</u> N/A	Management
		B. C. D.	Obtain (DF) _i for the til Records for the release Obtain Q _i for nuclide Management Records Obtain A _{iT} from the ap Age Group Infant Child	me period dt _i from Liquid Waste M se source(s) of interest. (i) for the time period dt ₁ from the s opropriate Liquid Dose Factor Ta <u>Dose Factor Table</u> N/A L-4	Management
		B. C. D.	Obtain (DF) _i for the til Records for the release Obtain Q _i for nuclide of Management Records Obtain A _{iT} from the ap Age Group Infant Child Teen	me period dt _i from Liquid Waste I se source(s) of interest. (i) for the time period dt ₁ from the s opropriate Liquid Dose Factor Ta Dose Factor Table N/A L-4 L-3	Management

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	METHO	DOLOGY SECTIO	<u>N</u>	
1.4 <u>Determining</u>	the Dose for Radioac	ctive Liquid Releas	<u>es</u> (continued)	
1. (contir	nued)	TARIE 1 A		
	FISH AND S	HELLFISH PATH	WAY	
TIME/DATE START:_	://	_ TIME/DATE STO)P::/	/HOURS
TOTAL DILUTION VO	DLUME: ORGAN:	_mls D	OSE FACTOR TABLE	: ::::::::::::::::::::::::::::::::::::
NUCLIDE (i)	C _i (µCi)	A _{iT}	DOSE (i) mrem	
				· · ·
· · · · ·				_
	· · ····			_
~~				
-				
	-			
	-			
L		TOTAL DOSE T =	=	mrem
E.	Solve for Dose (i)			-
	Dose (i)	$=\frac{Q_{i1} dt_1 A_{iT}}{(DF)_1}$		
F.	For the age group(s for each nuclide rep) of interest, repea orted and each org	t steps 1.4.1.C throu gan required.	ugh 1.4.1.E
G.	For the age group(s total dose to organ) of interest, sum t T from the fish-she	he Dose (i) values to Ilfish pathway.	o obtain the

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			METHODOLOGY SECTION	
1.5	Proiec	tina Da	se for Radioactive Liquid Effluents	
	Discus radwa effluer UNRE whole metho dose a	ssion - (ste trea nts whe STRIC body o d is pro as calcu	Control 3.11.1.3 requires that appropriate subsystems of atment system be used to reduce radioactive material in an the projected doses due to the liquid effluent, from ea TED AREAS (see TS Figure 5.1-1) would exceed 0.06 or 0.2 mrem to any organ in a 31 day period. The follow povided for performing this dose projection. The method ulated in section 1.4 with the adult as the bases for project	of the liquid liquid ich unit, to mrem to the ing calculation is based on ecting.
	1.	For the calcula doses	e controlling age group obtain the latest result of the mo ation of the whole body dose-and the highest organ dos can-be obtained from the in-plant_records.	onthly e. These
	2.	Divide during	each dose by the number of days the reactor plant was the month.	operational
	3.	Multipl project project neede operat	y the quotient of each dose by the number of days the react to be operational during the next month. The produted dose for the next month. These values should be a d to account for any changes in failed fuel or other iden ing conditions that could significantly alter the actual relations.	reactor plant is cts are the djusted as tifiable leases.
	4.	lf the p than-0 systen	projected dose is greater than 0.0 6 m rem to the whole b .2 mrem to the adults highest exposed organ, the liquid n shall be used.	ody or greater radwaste

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		METHODOLOGY SECTION	
2.0	GASEOUS R	ELEASES METHODOLOGY	
2.1	Gaseous Effl	uent Model Assumptions	
	Description o characteristic purposes only sides by the A Private proper meteorologic are 16 sector tower is calib A bearing of a and 11.25° do private proper calculation, the Unrestricted A over water ar O.W. (over w sector is O.W calculations u	<u>f Site</u> - (The FUSAR contains the official description of s. The description that follows is a brief summary for d y). The St. Lucie Plant is located on an island surround Atlantic Ocean and the Indian River, an estuary of the A erty adjoins the plant site in the north and south direction al tower is located north of the plant near the site propers s, for dose calculation purposes, divided into 22.5° each rated such that a zero degree bearing coincides with The zero degrees_dissects the north sector such that bearin efine the boundaries of the north sector. The nearest d rty occurs in the north sector at approximately 0.97 mile his 0.97 mile radius is assumed_in all directions, althoug Area Boundary is defined in Figure 5.1-1 of the TS. Do eas do not apply to Controls or the annual report and n rater) in lieu of performing calculations. The 0.97 mile ra- d., but it was chosen as the worst sector for conservativ using the historical MET data.	the site ose calculation led on two Atlantic-Ocean. ns. A erty line. There h. The MET RUE NORTH. gs of 348.75° listance to es. For ease of gh the real ses calculated hay be listed as ange in the NW e dose
	Historical ME from the St. L D.C. The me suggested by were also cal MET tables (determined th	<u>T Data</u> - MET data, between September 1, 1976 and A Lucie MET Tower was analyzed by_Dames & Moore of V ethodology used by Dames & Moore was consistent wit Regulatory Guide 1.111, Revision 1. Recirculation co culated for the St. Lucie Site and are incorporated into Tables M5, M6 and M7) in Appendix A of this manual. nat these two years are representative data for this loca	August 31, 1978, Washington, h methods rrection factors the historical It was ale.
-	Dose Calcula calculated us doses no low MET data fac annual report actual meteo	ations - Dose calculations for Control dose limits are not ing historical MET data and receptor location(s) which er than the real location(s) experiencing the mest expo- ctors are calculated and are normally used in dose calculate. Approximate and conservative methods may be use rological measurements.	rmally yield calculated sure. Actual ulations for the ed in lieu of
	Live MET dat manual. Hist used for ease limits may be dose calculat the annual re with Regulate Correction Fa	ta and hour-by-hour dose calculations are beyond the storical information and conservative receptor locations, e of Control dose limit calculations. Dose calculations f e performed using actual MET data and real receptor locations tions performed with actual data should note the source port. Actual MET data reduction should be performed ory Guide 1.111, Revision 1 and should incorporate Re- actors from Table M-4 of this manual.	cope of this etc., are only or Control dose cations. Any e of the data in in accordance circulation

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		ST. EUCLE FLANT	
		METHODOLOGY SECTION	
2.1	Gaseous Effl	uent Model Assumptions (continued)	
ļ	Dose Calcula	<u>itions</u> - (continued)	
	The St. Lucie effluents. On tables will be lodine-131 ar included in do contribution of Census inform census was t	e site uses the long term ground release model for all-ga ily those radionuclides that appear in the gaseous efflue considered in any dose calculations. Radioiodines are nd I-133 for application to Controls. Other nuclides of lo ose calculations for ease of performing calculations, bu loes not have to be included in the Control requirement mation will apply to the calendar year following the year aken in to avoid splitting quarters, etc.	aseous ent dose factor e defined as odine may be t their dose sLand t that the
2.2	Determining Establishing	the Total Body and Skin Dose Rates for Noble Gas Rel Setpoints for Effluent Monitors	eases And
	<u>Discussion</u> - releases to < requires that operable with exceeded. T Table 4.11-2	Control 3.11.2.1 limits the dose rate from noble gases i 500 mrem/yr - total body and <3000 mrem/yr - skin. Co the gaseous radioactive effluent monitoring instruments a alarm/trip setpoints set to ensure that these dose rate he results of the sampling and analysis program of Cor are used to demonstrate compliance with these limits.	n airborne ontrol 3.3.3.11 ation be limits are not ntrol
	The following total body an are based on releases on t release point The calculation November 19	calculation-method is provided for determining the dos d skin-from noble gases in airborne releases. The alar the dose rate calculations. The Controls apply to all a he site but all releases may be treated as if discharged . Only those noble gases appearing in Table G-2 will b on methods are based on Sections 5.1 and 5.2 of NUR 978. The equations are:	e rates to the m/trip setpoints irborne from a single e considered. EG-0133,
	For TOTAL E	BODY Dose Rate:	
		$DR_{TB} = \sum_{i} K_{i} (X/Q) (Q DOT)_{i}$	
	For TOTAL S	SKIN Dose Rate:	
		n	
	D	$R_{skin} = \Sigma [L_i + 1.1 M_i] (X/Q) (Q DOT)_i$	
	-	i	
I			

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			METHODOLOGY SECTION	
2.2	<u>Determini</u> Establishi	ng t ng t	<u>the Total Body and Skin Dose Rates for Noble Gas Release</u> Setpoints for Effluent Monitors (continued)	<u>es And</u>
	Where:			
	DR_TB	=	total body dose rate from noble-gases in airborne release	s (mrem/yr)
	DR_{skin}	=	skin dose rate from noble gases in airborne releases (mre	em/yr)
	ŗΣ	Π	a mathematical symbol to signify the operations to the rig symbol are to be performed for each noble gas nuclide (i) and the individual nuclide doses are-summed to arrive at dose rate for_the release source.	ht-of the through (n) the total
	Ki	=	the total body dose factor-due to gamma emissions for eagles nuclide reported in the release source. (mrem-m ³ / μ C	ich noble à-yr)
	Li	=	the skin dose factor due to beta emissions for each noble (i) reported in the assay of the release source. (mrem-m ³ /	gas nuclide /µCi-yr)
	Mi	=	the air dose factor due to gamma emissions for each nob nuclide (i) reported in the assay of the release source. Th 1.1 converts mrad to mrem since the units of M _i are in (mrad-m ³ /μCi-yr)	le gas ne constant
	(X/Q)	=	for ground level, the highest calculated annual long-term l relative concentration for any of the 16 sectors, at or beyo exclusion area boundary (sec/m ³)	historic ond the
	(Q DO∓) _i	=	The release rate of noble gas nuclide (i) in $\mu \text{Ci/sec}$ from the source of interest	he release
		÷		
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		METHODOLO	GY SECTION	
2.2	Determining Establishing	the Total Body and Skin Do Setpoints for Effluent-Monil	ose Rates for Noble Gas Rel tors (continued)	eases And
	1. Setpo	int Determination		
	Α.	To comply with Control 3.3 established to ensure that exceed the ODCM Control the site. Using pre-ODCM determined to be more lim therefore the site release r mrem/yr has been-determi being released from the site equivalent of 100 percent may be allotted a portion of release point portions allof percent. The release poin account the physical relea volume release rate and it point since uCi/sec is prop release points and an exami- Site Limit in Percent = 100	8.3.10, the alarm/trip setpoin all noble gas releases in pro I 3.11.2.1 noble gas release I Revision 0 data, the total be iting than_the-calculated skin rate limit of total body dose n ined to be equivalent to 3.5E te. Using 3.5E+05 uCi/sec a of the site limit, each release of the 100 percent, such that tted shall be less than or equi- t's actual monitor setpoint sh se characteristics of maximu s percent allotment for a sing ortional to volume rate. The mple of percent allotments is	ts are ogress do not rate limit-for ody dose was a dose, ate of 500 ±+05 uCi/sec as the e point on site the sum of all- ual to 100 nall take into um expected gle release e ODCM actual s provided:
		Site Limit in uCi/sec = 3.5	E+05 uCi/sec	
		(Exan	nple)	
	ODC	M Release Point	Percent <u>Allotment</u>	
	Unit Unit ECC ECC Unit Unit ECC ECC Blow Tota	1 Plant Vent 1 Fuel Bldg. Vent- S 1A S 1B 2 Plant Vent 2 Fuel Bldg. Vent S 2A S 2B rdown Bldg. Vent I Percent Allocated =	40 5 1 1 40 5 1 1 + 5 99 or 1 percent below the Site Limit	V

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2.2	<u>Detern</u> Establi	nining the To ishing Setpoi	<u>tal Body and⁻Skin Do</u> nts for Effluent Moni	ose Rates for Not tors (continued)	ole Gas-Relea	ses And
	1	(continued)		<u> </u>		
	1.					
		A. (conti	nued)			
-		sum o never Auxilia points short Chem Radia requir Monit Relea below releas equiva	of the total percent al be allowed to exceed ary Building Exhaust s, but a small percent periodic fan surveilla histry Procedure CY- tion Monitor Setpoin ed. CY-SL-104-011 or Setpoints provides use Rate Setpoint bas y. A release point's p se point's indicating e alent to the allocated	located to the abo d 100 percent. The are not ODCM re- tage should be all ince runs. This all SL-104-0112, De- ts where Chemist 2, Determination is calculation steps sed on the metho bercent allotment engineering unit of a portion of the site	The ECCS Re- equired monit lotted to each llocation is co termination of try Supervisor of Process Ra s to calculate dology steps will be conver f uCi/cc that v e limit.	Points shal actor ored releas to cover ntrolled pe Process- r approval i adiation a Noble G described ted into the will be
		1.	Obtain_the release release rate (V) in (Effluent Supervisor	point's <u>maximum</u> Cubic Feet per Mi	expected pro inute (cfm) fro	cess flow om the
		2.	Obtain the release from the Chemistry	point's percent o <u>f</u> Supervisor.	site limit allo	tment (PA)
		3 .	Substitute the relea equation(s) to obtain desired engineering	ise point's V and in the Release Po g unit (uCi/cc or u	PA values int bint's Setpoint Ci/sec).	o the belov (SP) in the
-		SP = ưCi/co	<u>3.5E+05 uCi x 60 s</u> c sec m	sec x <u>min</u> x in V ft3 28	<u>ft3</u> x <u>PA</u> 317 cc 100	(FPL:1))%
		SP = uCi/co	uCi/co	which is the TA SETPOINT for Channels that I Limit" declared	BLE 3.3-14 H ODCM Efflue have a "Allotte as their HIGH	HGH ent Gas ed % of Sit H SETPOII
		SP = uCi/co	c <u>3.5E+05 uCi x</u> <u>P/</u> sec 100	NFPL2] 1%		
		SP = uCi/ce	uCi/co)		

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				N	<u>IETHO</u>	DOL	<u>.0GY s</u>	SECTION		
2.2	Deterr	nining t	the To	al Bod	ly and	Skin	Dose F	Rates for N	loble Gas Re	leases And
	<u>Establ</u>	ishing	Setpoi	<u>nts for</u>	Efflue	<u>nt Mc</u>	onitors ((continued)	
	1.	(contir	ued)							2
-		Α.	(contin	ued)						
_			In the Monito uCi/se RANG at the same allotted	case of ring the c is equ E GAS maximu release d % of t	Unit 2 Plant uivalen chann um exp point (the Site	Plant Vent. t to 24 el 624 ected (i.e., e e Limit	t Vent⁻th The w A PV Plu 4 uses th proces each of t t).	ere are 3 C ide range c G LOW RA he equivale s flow rate. hese chanr	DCM Effluent hannel 624 HI NGE GAS-and nt-uCi/sec_bas Since they ar nels does=not r	Gas Channels GH SETPOINT in 2B PIG LOW ed on the uCi/cc e monitoring the eceive their own
			4.	The si "Allotte (Mid a discus	gnifica ed % o ind Hig ission):	nce o If Site Ih Not	f an OD Limit" H ble Gas	CM Effluen IIGH Setpo Accident C	t Gas Channe int requires fur hannels are no	l that has a ther discussion – ot part of this
				a.	For P "Allot Batch Venti Proce admin radio: to exe	Plant V ted % n Rele ng Op essing nistrat active ceed t	/ent Rel of Site ases fro peration Gaseo ively co concer the site	ease Points Limit" need om Gas Dee s, and at the us Waste s ntrolling Ba Itration and limit at any	s on each read is to be high en cay Tank and the e same time C hall-provide ins tch Releases s release rate w time.	tor unit, the hough to allow for Containment Y-SL-102-0105, struction for such that the vill not be allowed
				b .	The r the C appro mear conce Limit	eceipt DCM oximat the s entrati '.	t of a va Low Ra tely⁻equ site limit ion that	lid HIGH Al ange Gas C al to the HI has been e is equivale	larm on a relea hannel's radio GH Alarm setp exceeded, rath nt to the "Allott	ase point where activity is point does not er it is at a red % of Site
			setpoii	nt in <u>uC</u>	;i/cc	۷o	r Vmax-	ft3/minute <u>y</u>	vent flow	
			SP =				<u>uCi</u> x 2	<u>28317 cc</u> x	<u>Vmax ft3</u> x <u>mir</u>	nute
		uCi/sea	c (equiv	alent)			CC	ft3	minute 60	second
			SP =				<u>uCi</u>	equivaler	nt to a channel	indicating a
			(uCi/se	ec)			sec	uCi/cc co release ra	ncentration as ate of V or Vm	suming a volume ax.
			SP =				<u>uCi</u> x _	100	=	%
		(% of S	Site Lim	it) (at	oove)	sec	350,0	00 uCi/sec	of Site Lim	it

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<u></u>	- t t t	
2.2 <u>D</u> <u>E</u>	stablishing	Setpoints for Effluent Monitors (continued)
1.	. (conti	inued)
	Α.	(continued)
-		4. (continued)
-		c. The receipt of a valid HIGH Alarm on a release point where the-ODCM Low Range Gas Channel's- radioactivity is greater than the HIGH Alarm setpoint may quickly be <u>estimated</u> based on:
		F _{SL} = RP _{SL} + (Sum of- <u>all other</u> Release Point's RP _{SL} on site)
		RP _{SL} = Rel Pt's Rel Pt's volume time_ Channel's x Release x conv. x conv. x 1/(site limit) uCi/cc Rate (V) const. const.
		$RP_{SL} = \underline{uCi} \times \underline{V ft^3} \times \underline{28317 cc} \times \underline{min} \times \underline{sec}$ $cc \qquad min \qquad ft_3 \qquad 60 sec \qquad 3.5E+05 uCi$
		Where:
		F_{SL} = Fraction of the Site Limit
		RP _{SL} = Fraction of a Release Point's contribution to the site limit (Sum of <u>all other</u> Release Point's RP _{SL} on site is norm ally less than 0.10 under normal operating conditions.
		V = in ft ³ /min, the Release Point's actual process Volume flow release rate

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2.2	<u>Deter</u> Estab	mining (lishing_	<u>the Tot</u> Setpoi	<u>tal Bod</u> nts for	<u>y and Skin Dose Rates for Noble Gas Rel</u> Effluent Monitors (continued)	eases And
-	1.	(contir	nued)			
-		A.	(conti	nued)		
			4.	(contii	nued)	
				C.	(continued)	
				A valu Site L Proce Point This n	ue of RP _{SL} >1.0 or a F _{SL} >1.0 would be exe imit Based on the above <u>estimate</u> . Off No dure allow 1 hour to obtain a grab sample so that the actual site limit situation may b nethod is discussed in the following step.	ceeding the ormal of the Release e evaluated.
			5.	To qu the fo	antify the Release Point's <u>actual Noble Ga</u> llowing would need to be performed:	<u>as-Dose Rate</u> ,
				a.	A Noble Gas Activity Grab Sample would and analyzed to determine each Noble G concentration.	l be obtained Sas Isotopic
				b .	The results would be used to-perform ca ODCM Step 2.2.2 for Noble Gas Total Be and Skin Dose Rate.	lculations-per ody Dose Rate
-				с .	If the Release Point's HIGH Alarms were the Table 3.3-14 ODCM Related Particul lodine Channel, then ODCM Step 2.3 ca should be performed as soon as possible continuous collection medium(s) and a T can be pulled and analyzed to evaluate of ODCM Control 3.11.2.1.b.	received on ate and/or lculations after the ritium Sample compliance with

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2.2 <u>Determining f</u> Establishing	the Total Body and Skin Dose Rates for Noble Gas Rel Setpoints for Effluent Monitors (continued)	eases And-
1. <u>(</u> contir	nued)	
B	No Particulate or lodine Radioactivity Channels are record DCM. Table 3.3-13 requires lodine and Particulate Si Technical Specification Table 3.3-6 requires a Fuel Bui Particulate Channel (the bases for the setpoint on the F Vent Particulate Channel is described in 2.2.1.C). The does describe Particulate and lodine Radioactivity Cha Channels are listed in ODCM Table 3.3-14 and ALERT Setpoints are provided. The intent of providing these s provide early warning that the effluent pathway condition increased such that a grab sample should be obtained Alarm Setpoint is reached or exceeded. The Particulate HIGH Alarm Setpoint bases is that the collection media filter where continuing deposition of radioactivity would increase in the channel count rate up to the setpoint leresulting dose rate can be shown to be less than 1 per limit for ODCM Control 3.11.2.1.b for lodine-131, loding radionuclides in particulate from with half-lives greater that these channel detectors are gross activity monitors scintillation type where the count rate is not dependent threshold) on the energy of the isotope entrained on the sample collection volume. Plant historical trends have Noble Gas Activity may contribute to the count rate of Auxiliary Building (Plant) Vent Particulate and lodine C In this event the Noble Gas contribution may be added Table 3.3-14 Alert and High Setpoints for Unit 2 Plant N The sampling mediums associated with the Particulate Channels in Table 3.3-14 are also controlled by the record DCM Table 4.11-2 which requires 4/M Minimum Ana Frequency of the sampling mediums. These analysis a confirm and quantify the isotopic composition of the radio collection medium would be confirmed by these analysis and the set of the sampling mediums. These analysis and the set of the sampling mediums and the radio confirmed by these analysis and the set of the sampling mediums. These analysis and the set of the sampling mediums would be confirmed by these analysis and the set of the sampling mediums. These analysis and the set of th	uired by the samplers only. Iding Vent Fuel Building Unit 2 FUSAR nnels. These and HIGH tetpoints is to ons have if a HIGH te and lodine ums are fixed cause a vel(s), the cent of the site e-133, and all than 8 days, is s of the (above e collection indicators is accrued shown that the Reactor hannel(s). to the Vents only.

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2.2	<u>Determining</u> Establishing	the Total Body and Skin Dose Rates for Noble Gas Releases And Setpoints for Effluent Monitors (continued)	
	1. (conti	nued)	
	В.	(continued)	
		If an alarm occurs, Channel Check(s) should be performed on thes channel(s), an ALERT Alarm should be investigated and a HIGH Alarm shall require isotopic analysis of particulate and/or iodine channel medium of the affected channel(s). The isotopic analysis the medium shall be used to evaluate particulate and/or iodine dos rate levels per the methodology of ODCM 2.3.	e of e
	C.	To comply-with Technical Specification 3.3.3.1, Table 3.3-6 Radiation Monitoring Instrumentation, "Instrument 2.a.ii. Particulate Activity", with Alarm/Trip Setpoint determined and set in accordance with the requirements of the Offsite Dose Calculation Manual, the following the BASES for Fuel Building Particulate Channel High Alarm Setpoints for Unit 1 and Unit 2:	ior e is
		Unit 1 Fuel Building:	
		The 10,000 cpm High Setpoint is based on an Infant's Maximum Exposed Organ Dose Rate (Liver) from Inhalation of Cs-137 at the Site Boundary. The value of 10,000 cpm is very conservative relat to the site dose rate limit of 1500 mrem/yr. The methodology is based on measured particulate channel count rates when the detector was calibrated with a known source activity of Cs-137, and on default assumptions as follows:	.iv∘ d
-		 The particulate channel read 32,385 ccpm when exposed to 7.67 uCi source of Cs-137.) a
-		 Assuming that 7.67 uCi of Cs-137 were collected during 1 hour of skid sample collection (fixed filter), the typical sam volume would yield ~3.3E+06 cc's. Greater than 99% samp filter efficiency is assumed. 	ple le
		3. The maximum building process flow exhaust is ~24,576 cfm	1.
		4. Q(dot) for Cs-137 uCi/sec release rate is approximately 27 uCi/sec as follows:	
	<u>7.67 u</u> hour	<u>Ci x hour x 28317 cc's x 24576 ft3 x min = 27 uCi</u> 3.3E+06cc.s ft3 min 60 sec sec	

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2.2	<u>Determir</u>	ning the Tol	tal Body and S	<u>Skin Dose R</u>	ates for Nob	<u>le Gas Rele</u>	eases And
	Establist	ing Setpon	<u>nts tor Ettiuen</u>	<u>it ivionitors</u> (e	continuea)		
	1 ⁻ . (c	ontinued)					
	C	. (contii	nued)				
		5.	The default h site boundar	nistorical (X/ y is 1.3E-06	Q)d for the w meters/sec.	vorst sector	(NW) at the
		6.	The dose rat ODCM Secti resulting dos	e (equivaler on₋2.3 Inhal e rates yield	it to 10,000 c ation Dose F I.	cpm) is calc Rate to an Ir	culated per nfant . The
	Bone mrem/yr 7.4E∓00	Liver mrem/yr 7 . 9E+00	Thyroid mrem/yr 0.0E+00	Kidney mrem/yr 4.2E-01	Lung mrem/yr 1.0E+00	GI-LLI mrem/yr 1.5E-02	W.Body mrem/yr 4.8E-01
		7.	The ODCM 3 1500 mrem/y Liver is the n site dose rate	3.11.2.1.b do yr. From the naximum ex e limit.	ose rate limit preceding c posed organ	to any orga calculation t at 0.52 per	an is he Infant's rcent of the
		8.	A-particulate conservative activity on a product-pres sample colle adequate wa were being n Cs-137 activ	channel set setpoint giv fixed filter, C ent at all tim ction interva urning respon eleased, i.e. ity of ~2.3E-	point of 10,0 en that this o Cs-137 is a ty les with sper ls shorter than se if signific , the above a 06 uCi/cc.	000 cpm pro channel ana /pical long-l nt fuel in the an 1 hour w cant particu assumption	ovides a alyzes gross lived fission e pool, and that vould provide late activity s assume a
		9.	The setpoint provide early rate calculati channel is ca compliance w performed to with real high performing d evaluation)	of 10,000 c detection/a ons_are pro- apable of de with the OD(accurately n alarm ever ose rate cal	pm was adm larm of a pro vided to docu tection sensi CM site limit. calculate act nts as per the culations. (E	inistratively oblem. The ument that f itivities to in Grab sam ual release e ODCM mo nd of Unit 1	y chosen to above dose the particulate sure ples should be is associated ethodology for I Fuel Building

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2.2	<u>Determi</u> Establis	ning the To	tal Body and	<u>Skin Dose R</u> nt Monitors (/	ates for Nob	<u>ie Gas Rele</u>	ases And
_	1. (c	continued)			Johandedy		
	C	cont	inued)				
		<u>Unit</u> 2	2 Fuel Buildin	<u>g:</u>			
		The 1 Expo Site E to-the based detec on-de	0,000 cpm H sed Organ Do Boundary. Th site dose rat d on measure tor was calibu	igh Setpoint ose Rate (Liv le value of 10 e-limit of 150 d particulate rated with a k tions as follo	is based on a er) from Inha 0,000 cpm is 0 mrem/yr. channel cou nown source ws:	an Infant's M lation of Cs very conse The₋method nt-rates who activity of	Maximum 5-137 at the rvative relative lology is en the Cs-1 3 7, and
		1.	The particul 7.59 uCi so	ate channel i urce of Cs-13	read 39,782 (7 (decayed f	ccpm when to June 19,	exposed to a 1996 data).
		2.	Assuming th hour of skid volume wou filter efficien	nat 7.59 uCi o sample colle Ild yield 4.08l Icy is assume	of Cs-137 we oction (fixed f E+06 cc's. G ed.	re collected ilter), the ty creater than	l during 1 pical sample 99% sample
		3.	The maximu	um building p	rocess flow e	exhaust is ~	·31,584 cfm.
		4.	Q(dot) for C 21 uCi/sec a	s-137 uCi/se as follows:	c release rat	e is approxi	imately
	<u>7.5</u> h	<u>59 uCi</u> x 10ur 4.0	<u>hour</u> x)8E+ 0 6cc.s	<u>28317 cc's</u> ft3	x <u>31584 ft3</u> min	x <u>min</u> 60 sec	= <u>27.72 uCi</u> sec
		5.	The default site bounda	historical (X/ ry is 1.3E-06	Q)d for the w meters/sec.	orst sector	(NW) at the
		6.	The dose ra ODCM Sect resulting do	ite (equivaler tion 2.3 Inhal se rates yield	it to 10,000 c ation Dose R I.	pm) is calc ate to an Ir	ulated per Ifant. The
	Bone mrem/vr	Liver mrem/vr	Thyroid mrem/yr	Kidney mrem/vr	Lung mrem/vr	GI-LLI mrem/vr	W.Body

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2.2	<u>Dete</u> Estal	rmining olishing	g the To g Setpo	otal Body and Skin Dose Rates for Noble Gas Releases And pints for Effluent Monitors (continued)
_	1.	(con	tinued)	
		C.	(cont	linued)
			7.	The ODCM 3.11.2.1.b dose rate limit to any organ is 1500 mrem/yr. From the preceding calculation the Infant's Liver is the maximum exposed organ at 0.34 percent of the site dose rate limit.
			8.	-A particulate channel setpoint of 10,000 cpm_provides a conservative setpoint given that this channel analyzes gross activity on a fixed filter, Cs-137 is a typical long-lived fission product present at all times with spent fuel in the pool, and tha sample collection intervals shorter than 1 hour would provide adequate warning response if significant particulate activity were being released, i.e., the above assumptions assume a Cs-137 activity of ~1.4E-06 uCi/cc.
			9.	The setpoint of 10,000 cpm was administratively chosen to provide early detection/alarm of a problem. The above dose
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2.2 <u>Dete</u> Esta	ermining Iblishing	the Total Body and Skin Dose Rates for Noble Gas Releases And Setpoints for Effluent Monitors (continued)		
2 .	Total	Body and Skin Nuclide Specific Dose Rate Calculations		
	The fo body o compl releas	ollowing outline provides a step-by-step explanation of how the total dose rate is calculated on a nuclide-by-nuclide basis to evaluate iance with Control 3.11.2.1. This method is only used if the actual es exceed the value of 3.5 X 10 ⁵ μCi/sec.		
	A.	The (X/Q) value =sec/m ³ andis the most limiting sector at the exclusion area. (See Table M-1 for value and sector.)		
	В.	Enter the release rate in ft ³ /min of the release source and convert it to:		
		$= \frac{()ft^{3}}{min} \times \frac{2.8317 \times 10^{4} \text{ cc}}{ft^{3}} \times \frac{min}{60 \text{ sec}}$		
		= cc/sec volume release rate		
	C.	Solve for(Q DOT) _i for nuclide (i) by obtaining the µCi/cc assay value of the release-source and multiplying it by the product of 2.2.2.B above		
		(Q DOT) _i = (nuclide [i])		
		$\frac{(assay) \ \mu Ci}{cc} X \frac{(2.2.2.B \ value) \ cc}{sec}$		
		$(Q DOT)_i = \mu Ci/sec_for nuclide (i)$		
	D.	To evaluate the total body dose rate obtain the K_i value for nuclide (i) from Table G-2.		
	E.	Solve for DR _{TBi}		
		$DR_{TBi} = K_i (X/Q) (Q DOT)_i = \frac{mrem - m^3}{\mu Ci - yr} X \frac{sec}{m^3} X \frac{\mu Ci}{sec}$		
		$DR_{TBi} = \frac{mrem}{yr}$ total body dose from nuclide (i) for the specified release source		
·				

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	2.	(cont	inued)		
		F.	To evaluate the skin dose rate, obtain the L_i and M_i valuable G-2 for nuclide (i).	ues from	
		G.	Solve for DR _{skin i}		
			$DR_{skin i} = [L_i + 1.1 M_i]^{-}(X/Q)(Q DOT)_i$		
			$DR_{skin i} = \frac{mrem_{-}}{yr} skin dose from nuclide (i) for the speci$	fied release	
	H.		Repeat steps 2.2.2.D through 2.2.2.G for each noble g reported in the assay of the release source.	as nuclide (i)	
		I.	The Dose Rate to the Total Body from radioactive nob radiation from the specified release source is:	le gas gamma	
			п		
			$DR_{TB} = \Sigma DR_{TBi}$		
			i		
		J.	The_Dose Rate to the skin from noble gas radiation fro release source is:	m the specified	
			n		
			$DR_{skin} = \Sigma DR_{skin}$ i		
			1		
			The dose-rate contribution of this release source shall _other_gaseous release sources that are in progress at interest. Refer to-in-plant procedures and logs to dete Dose Rate to the Total Body and Skin from noble gas	be added to all the time of rmine the Total effluents.	



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2.3	<u>Determining</u> <u>Releases</u> (co	<u>the Ra</u> ontinue	adioiodine & Particulate Dose Rate to Any Organ I ed)	From Gaseous
	For Total Do	se Ra	te from I & 8DP and H-3 To An Infant Organ T:	
	$DR_T = \frac{\Sigma}{Z}[DR_T]$	Ri&8DPT	+ DR _{H-3т}]	
	Where:			
ļ	Т	=	The organ of interest for the infant age group	
	z	=	The applicable pathways	
	DRI&8DPT	=	Dose Rate in mrem/yr to⁼the organ T from iodine particulates	es and 8 day
	DR _{H-3} T	=	Dose Rate in mrem/yr to organ T from Tritium	
-	DR_{T}	=	Total Dose Rate in mrem/yr to organ T from all p under consideration	pathways
	ľΣ	=	A mathematical symbol to signify the operations the symbol_are to be performed for each nuclide and the individual_nuclide dose rates are summe the total dose rate from the pathway.	to the right of (i) through (n) ed to arrive at
	Σ Z	=	A mathematical symbol to indicate that the total to organ T is the sum of each of the pathways d	dose rate D⊤ ose rates
	R _i	=	The dose factor for nuclide (i) for organ T for the specified (units vary by pathway)	pathway -
	Pi	=	The dose factor for instantaneous ground plane units of <u>mrem-m² sec</u> µCi-yr	pathway in

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2.3	<u>Determining</u> <u>Releases</u> (c	the Radioiodine & Particulate Dose Rate to Any Organ continued)	From Gaseou				
	grass-cow/goat-milk pathway has been identified as the most limiting pathway with the infant's thyroid being the critical organ. This pathway typically contributes >90% of the total dose received by the infant's thyroid and the radioiodine contribute essentially all of this dose. Therefore, it is possible to demonstrate compliance with the release rate limit of Control 3.11.2.1 for radioiodines and particulates by only evaluating the infant's thyroid dose for the release of radioiodines via the grass-cow/goat-milk pathway. The calculation method of Section 2.3.3 is used for this determination. If this-limited analysis approach is used, the dose calculations for other radioactive particulate matter and other pathways need not be performed. Only the calculations of Section 2.3.3 for the radioiodines need be performed to demonstrate compliance with the Control dose rate limit. The calculations of Sections 2.3.1, 2.3.2, 2.3.4 and 2.3.5 may be omitted. The dose rate calculations as specified in these sections are included for completeness and are to be used only for evaluating unusual circumstances where releases of particulate materials other than radioiodines in airborne releases are abnormally high. The calculations of Sections 2.3.1, 2.3.2, 2.3.4 and 2.3.5 will typically be used to demonstrate compliance with the dose rate limit of Control 3.11.2.1 for radioiodines and particulates when the measured releases of particulate material						
	radioiodines (other than releases of	s and-particulates when the measured releases of particu radioiodines and with half lives >8 days) are >10 times th radioiodines.	late material ne measured				
	(other than releases of 1. <u>The</u>	s and-particulates when the measured releases of partic∟ radioiodines and with half lives >8 days) are >10 times th radioiodines. Inhalation Dose Rate Method:	late material ne measured				
	(other than releases of 1. <u>The</u>	s and-particulates when the measured releases of particulates radioiodines and with half lives >8 days) are >10 times the radioiodines.	late material ne measured				
	ased to den radioiodines (other than releases of 1. <u>The</u> A.	s and-particulates when the measured releases of particulates radioiodines and with half lives >8 days) are >10 times the radioiodines.	ated in the late range. The his value is				
	ased to den radioiodines (other than releases of 1. <u>The</u> A.	s and-particulates when the measured releases of particulates radioiodines and with half lives >8 days) are >10 times the radioiodines.	ated in the late range. The his value is stor and range				

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3	Deter	mining	the Radioiodine & Particulate Dose Rate to Any Organ From Gaseous
.0	Relea	ises (co	ntinued)
	1.	(contir	ued)
		C.	Solve for (Q DOT) _i for nuclide (i) by obtaining the μ Ci/cc assay value of the release source activity and multiplying it by the product of 2.3.1.B above.
			$(QDOT)_i = \frac{(nuclide[i]assay) \mu Ci}{cc} X \frac{(Value 2.3.1.B)cc}{sec}$
			$(Q DOT)_i = \mu Ci/sec$ for nuclide (i)
		D.	Obtain the R _i value from Table G-5 for the organ T.
		E.	Solve for DR _i
			$DR_{iT} = R_{iT} (X/Q)_{D} (Q DOT)_{i} = \frac{mrem - m^{3}}{\mu Ci - yr} X \frac{sec}{m^{3}} X \frac{\mu Ci}{sec}$
			DR _{iT} = <u>mrem</u> The Dose Rate to organ T from nuclide (i) yr
		F.	Repeat steps 2.3.1-C through 2.3.1.E for each nuclide (i)_reported in the assay of the release source.
		G.	The Dose Rate to the Infants organ T from the Inhalation Pathway is:
			$DR_{inhalation_T} = DR_1 + DR_2 + \dots + DR_n$
			for all nuclides except H-3. This dose rate shall be-added to the other pathways as per 2.3.5 - Total Organ Dose.
	Steps	s 2.3.1.0	<u>NOTE</u> C through 2.3.1.G need to be completed for each organ T of the
	Indi	L	

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.3 <u>Detern</u>	nining t	he Radioiodine & Particulate Dose Rate to Any Organ	From Gaseous
<u>Releas</u>	<u>es</u> (co	ntinued)	
2.	The G	round Plane Dose Rate Method:	
_		<u>NOTE</u> Tritium dose via the ground plane is zero.	
	A.	The controlling location is assumed to be an Infant loca sector at themile range. Th location is1/m ² . This value is common to (See Table M-2 for sector, range and value.)-	ated in the e (D/Q) for this all nuclides.
	В.	Enter the release rate in ft ³ /min of the release source a cc/sec.	and convert to
=	f min	$\frac{t^3}{10} \times \frac{2.8317 \times 10^4 \text{ cc}}{\text{ft}^3} \times \frac{\text{min}}{60 \text{ sec.}} = \text{cc/sec}$	
	C.	Solve for (Q DOT) _i for nuclide (i) by obtaining the μ Ci/c from the release source activity and multiplying it by th 2.3.2.B above.	c assay value e product of
(QDOT	$r_{i} = \frac{(\text{nuclide}[i] \text{ assay}) \mu \text{Ci}}{\text{cc}} \times \frac{(\text{Value 2.3-2.B}) \text{ cc}}{\text{sec}}$	
(Q DOT) _i = $\mu Ci/sec$ for nuclide (i)	
	D.	Obtain the P _i value from Table G-3	
	E	Solve for DR _i	
Γ)Ri=Pr	$T_{T}(D/Q) (Q DOT)_{i} = \frac{mrem - m^{2} - sec}{\mu Ci - yr} X \frac{1}{-m^{2}} X \frac{\mu Ci}{sec}$	
E)R _i =	<u>mrem</u> The Dose Rate to organ T from nuclide (i) yr	
	F.	Repeat steps 2.3.2.C through 2.3.2.E for each nuclide the assay of the release source.	(i) reported in
		,,,,,,	

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2.3	<u>Dete</u> Relea	<u>rmining (</u> ases (co	the Radioiodine-& Particulate Dose Rate to Any Organ From Gaseous ntinued)
	2.	(contir	nued)
		G.	The Dose Rate to the Infant's Whole Body from the Ground Plane Pathway is:
			$DR_{GrPl} = DR_1 + DR_2 + \ + DR_n$
			for all nuclides. This dose rate shall be added to the other pathways as per 2.3.5.
	3.	<u>The-G</u>	rass-Cow/Goat-Milk Dose Rate Method:
			NOTE
			H-3 dose is calculated as per 2.3.4.
		A.	The controlling animal was established as a located in the sector at miles. The (D/Q) for this location is 1/m ² . This value is common to all nuclides. (See Table M-3 for sector, range and value.)
		В.	Enter the anticipated release rate in ft ³ /min of the release source and convert to cc/sec.
			$= -\frac{\text{ft}^{3}}{\text{min}} \times \frac{2.8317 \times 10^{4} \text{ cc}}{\text{ft}_{3}} \times \frac{\text{min}}{60 \text{ sec.}} = \text{cc/sec}$
		C.	Solve for (Q DOT) _i for nuclide (i) by obtaining the μ Ci/cc assay value of the release source activity and multiplying it by the product of 2.3.3.B above.
			$(QDOT)_i = \frac{(nuclide[i]-assay) \mu Ci}{cc} \times \frac{(value 2.3.3.B)cc}{sec}$
-			$(Q DOT)_i = \mu Ci/sec$ for nuclide (i)
		D.	Obtain the R _i value from Table G-6(7) (whichever is the controlling animal, cow/goat, for infant).
			If the limited analysis approach is being used, limit the calculation to the infant thyroid.

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.3 [Determin	ing t	he Radioiodine & Particulate Dose Rate to Any Organ From Gaseous
- <u>F</u>	Releases	(co	ntinued)
3	3. (co	ontin	ued)
	E.		Solve for DR
			$DR_{iT} = R_{iT} (D/Q) (Q DOT)_{i} = \frac{mrem - m^{2} - sec}{\mu Ci - yr} X \frac{1}{m^{2}} X \frac{\mu Ci}{sec}$
			DR _{iT} = <u>mrem</u> the Dose Rate to organ T from nuclide (i) yr
	F.		Repeat steps 2.3.3.C through 2.3.3.E for each nuclide (i) reported in the assay of the release source.
			Only the radioiodines need to be included if the limited analysis approach is being used.
	G.		The Dose Rate to the Infant's organ T from GrassMilk pathway is:
			DR_{grass} Milk _T = DR_1 + DR_2 + + DR_n
			for all nuclides. This dose rate shall-be added to-the other pathways as per 2.3.5 - Total Organ Dose.
_			NOTE
	Steps 2.3 nfantL approach	3.3.C imit n is t	through 2.3.3.G need to be completed for each-organ of the the calculation to the infant thyroid if the limited analysis being-used.
			· · · · · · · · · · · · · · · · · · ·

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2.3	<u>Deter</u> Relea	<u>mining t</u> I <u>ses</u> (co	the Radioiodine & Particul ntinued)	ate Dose Rate to Any Organ	From Gaseous
	4.	<u>The H</u>	-3 Dose Rate Method:		
		A.	The controlling locations are:	and their $(X/Q)_D$ values for ea	ch pathway
			Inhalation - Infant at	range in the	sector.
			$(X/Q)_D = sec/m^3$ (See Table M-2 for range, sec	tor and value)
-			Ground Plane - Does not	apply to H-3	
			<u>Grass-Cow/Goat-Milk-</u> atmiles with an Inf sector drinking the milk. $(X/Q)_D =secsector corresponding to the$	located in the ant at the exclusion area in th The (X/Q)ூ for the c/m ³ . (From Table M-6 at the he location of the Milk Animal	e sector le location=is range and above.)
		В.	Enter the anticipated rele convert it to cc/sec.	ase rate in ft ³ /min of the relea	ise source and
			$={min} ft^{3} \times \frac{2.8317 \times 10^{4}}{ft^{3}}$	$\frac{-cc}{60 \text{ sec.}}$	
			= cc/sec volume	release rate	
		-C.	Solve for (Q DOT) _{H-3} for of the release source and above.	Fritium, by obtaining the µCi/o Fmultiplying it by the product	c assay value of 2.3.4.B
-			$(QDOT)_{H-3} = \frac{(H-3) \mu Ci}{cc}$	(2.3.4.Bvalue)cc sec	
-			(Q DOT) _{H-3} = μCi/se	c activity release rate	
		D.	Obtain the Tritium dose fa	actor (R_i) for Infant organ T fr	om:
			PATH	TABLE #	
			Inhalation	G-5	
			Grass-Cow/Goat-Milk	G-6(7)	

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2.3	<u>Dete</u> Rele	ermining eases (co	the Radioiodine & Particulate Dose Rate to Any Organ From Gaseou ontinued)
	4.	(conti	nued)
		E.	Solve-for D_{H-3} (Inhalation) using the (X/Q) _D for inhalation from 2.3.4.4 and R_{H-3} (Inhalation) from 2.3.4.D.
			$DR_{H-3_{lnh_T}} = R_{H-3} (X/Q)_D (Q DOT)_{H-3}$
			$DR_{H_{3_{inh_{T}}}} = mrem/yr from H - 3 Infant Inhalation for organ T$
		F.	Solve for D _{H-3} (GrassMilk) using the (X/Q) _D for GrassMilk from 2.3.4.A and R _{H-3} (GrassMilk) from 2.3.4.D
			$DR_{H-3GMT} = R_{H-3GMT} (X/Q)_{D} (Q DOT)_{H-3}$
			DR _{H-3GMT} = mrem/yr .from H - 3 Infant
		G.	Repeat steps 2.3.4.D through 2.3.4.F for each Infant organ T of interest.
-		H.	The individual organ dose rates from H-3 shall be added to the other organ pathway dose-rates as per 2.3.5.
			-

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	Releases (co	ntinued)		y Organ	-	
	5. <u>Deterr</u> <u>H-3 fro</u>	nining the Total Organ om Release Source(s)	Dose-Rate from lodines	<u>, 8D-Par</u>	ticulates, and	
	Α.	The following table de to arrive at the total de	escribes all the pathways ose rate to an organ T:	that mus	st be summed	
		PATHWAY	DOSE RATE	ST	EP # REF.	
		Inhalation (I&8DP)			2.3.1.G	
	- Gi	ound Plane (I&8DP)	(Whole Body only)	ť	2.3.2.G	
	Gr-	Milk (1&8DP)			2.3.3.G	
		Inhalation (H-3)			2.3.4.E	
-	Gr	Milk (H-3)			2.3.4.F	
		DR _T =	(sum of above)			
	В.	Repeat the above sur	nmation for each Infant o	organ T.		
-	C.	The DR _T above shall site that will be in prog procedures and logs t	be added to all other rele gress at any instant. Ref to determine the Total DI	ease sour fer to=in-p R⊤ to eac	rces on the plant h organ.	
2.4	Determining	the Gamma Air_Dose f	or Radioactive Noble Ga	is Releas	e Source(s)	
	Discussion - effluents for g calendar yea noble gas ga November-19 -equation may annual repor used as outli air dose is	Control 3.11.2.2 limits gamma radiation to <5 r. The following calcul mma air dose and is b 978. The dose calcula y be used for Control d t or for projecting dose ned in the detailed exp	the air dose due to noble mrads for the quarter ar lation method is provided ased on section 5.3.1 of tion is independent of an lose calculation, the dose , provided that the appro- planation that follows. The	e gases i nd to <10 l for dete NUREG ny age gro e calculat opriate va ne equati	n gaseous mrads in any rmining the -0133, oup. The tion for the lue of (X/Q) is on for gamma	
	n uooo is.					
	 _{Dγ} - air = Σ3	.17 X 10 ⁻⁸ M₁ (X/Q) Q₁				
	i					
1						

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2.4	Determining (continued)	e Gamma Air Dose for Radioactive Noble Gas Release Source(s)
	Where:	
-	D _Y -air	gamma air-dose in mrad from radioactive noble gases.
-	Σ	A-mathematical symbol to signify the operations to the right side of the symbol are to be performed for each nuclide (i) through (n)- and summed to arrive at the total dose, from all nuclides reported during the interval. No units apply.
	3.17 ⁻ X ⁻ 10 ⁻⁸⁻	the inverse of the number of seconds per year with units of year/sec.
	M _i	the gamma air dose factor for radioactive noble gas nuclide (i) in units of $\frac{mrad-m^3}{\mu Ci-yr}$
	(X/Q)	the long term atmospheric dispersion factor for ground level releases in units of sec/m ³ . The value of (X/Q) is the same for all nuclides (i) in the dose calculation, but the value of (X/Q) does vary depending on the Limiting Sector the Control is-based on, etc.
	Qi	the number of micro-curies of nuclide (i) released (or projected) during the dose calculation exposure period. (e.g., month, quarter or year)

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2.4	<u>Deter</u> (cont	mining t inued)	the Gamma Air Dose for Radioactive Noble Gas Releas	se Source(s)
-	The f dose	ollowing is calcu	steps provide a detailed explanation of how the radion lated.	uclide specific
_	1.	To det the typ Dose f nuclide	ermine the applicable (X/Q) refer to Table M-1 to obtain be of dose calculation being performed. (i.e., Quarterly Projection for examples). This value of (X/Q) applies to e (i).	n the value for Control or each
	2.	Deterr	nine (M _i) the gamma-air dose factor for nuclide (i) from-	Table G-2.
	3.	Obtain waste interva	n the micro-Curies of nuclide (i) from the in-plant radioad management logs for the sources under consideration al.	ctive gaseous during the time
	4.	Solve	for D _i as follows:	
		$D_i = \frac{3}{2}$	$\frac{17 \text{ X} 10^{-8} \text{ yr}}{\text{sec}} \times \frac{\text{M}_{\text{i}} \text{mrad} - \text{m}^{3}}{\mu \text{Ci} - \text{yr}} \times \frac{(\text{X/Q}) \text{sec}}{\text{m}^{3}} \times \frac{\text{Q}_{\text{i}} \mu \text{Ci}}{1}$	
-		D _i = 1	mrad = the dose from nuclide (i)	
	5.	Per <u>f</u> or time ir	m steps 2:4.2 through 2.4.4 for each nuclide (i) reported aterval in the source.	d during t he
	6.	The to dose⁻c	tal gamma air dose for the pathway is determined by su of each nuclide (i) to obtain D _Y -air dose.	umming the D _i
		D _{Y-air} =	$= D_1 + D_2 + \ + D_n = mrad$	-
	7.	Refer applic	to in-plant procedures for comparing the calculated-dos able limits that might apply.	e to any

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2.5	.5 Determining the Beta Air Dose for Radioactive Noble Gas Releases					
-	<u>Discussion</u> - Control 3.11.2.2 limits the quarterly air dose due to beta radiation from noble gases in-gaseous effluents to <10 mrads in any calendar quarter and <20 mrads in any calendar year. The following calculation method is provided for determining the beta air dose and is based on Section 5.3.1 of NUREG-0133, November 1978. The dose calculation is independent of any age group. The equation may be used for Control dose calculation, dose calculation for annual reports or for projecting dose, provided that the appropriate value of (X/Q) is used as outlined in the detailed explanation that follows.					
	The equation	for beta air_dose is:				
		n_{B-air} $\Sigma = 3.17 \times 10^{-8} N_i (X/Q) Q_i$ i.				
	Where:					
	D _{B-air}	 beta air dose in mrad from radioactive noble gases. 				
	ŗΣ	 a mathematical symbol to signify the operations to the right side of the symbol are to be performed for each nuclide (i) through (n) and summed to arrive at the total dose, from all nuclides reported during the interval. No-units apply. 				
-	3.17 X 10 ⁻⁸	the inverse of the number of seconds per year with units of year/sec.				
-	Ni	= the beta air dose factor for radioactive noble gas nuclide (i) in _units of $\frac{mrad-m^3}{\mu Ci-yr}$				
	(X/Q)	the long-term atmospheric dispersion factor for ground level releases in units of sec/m ³ . The value of (X/Q) is the same for all nuclides (i) in the dose calculation, but the value of (X/Q) does vary depending on the Limiting Sector the Control is based on, etc.				
	Qi	the number of micro-Curies of nuclide (i) released (or projected) during the dose calculation exposure period				
l						

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2.5	<u>Deter</u>	mining (the Beta Air Dose for Radioactive Noble Gas Releases	(continued)
	The f	ollowing	steps provide a detailed explanation of how the dose is	s calculated.
	1.	To-det the typ projec	ermine the applicable (X/Q) refer to Table M-1 to obtain be of dose calculation being performed (i.e., quarterly C tion for examples). This value of (X/Q) applies to each	۱ the value for ontrol or Dose nuclide (i).
r	2.	Deterr	nine (N _i) the beta air dose factor for nuclide (i) from Tab	ole G-2.
	3.	Obtain waste interva	the micro-curies of nuclide (i) from the in-plant radioac management logs for the source under consideration_d l.	tive gaseous uring the time
	4.	Solve	for D _i as follows:	
-		$D_i = \frac{3}{2}$	$\frac{17 \text{ X} \text{ 10}^{-8} \text{ yr}}{\text{sec}} \text{ X} \frac{\text{N}_{\text{i}} \text{ mrad} - \text{m}^{3}}{\mu \text{Ci} - \text{yr}} \text{ X} \frac{(\text{X}/\text{Q}) \text{ sec}}{\text{M}^{3}} \text{ X} \frac{\text{Q}_{\text{i}} \mu \text{Ci}}{1}$	
		D _i = m	rad = the dose from nuclide (i)	
-	5.	Perfor -time ir	m steps 2.5.2 through 2.5.4 for each nuclide (i) reported iterval in the release source.	d during the
	6.	The to dose o	tal beta air dose for the pathway is determined by sum of each nuclide (i) to obtain D _{B-air} dose.	ning the D _i
		D _{B-air} =	$= D_1 + D_2$ + $D_n = mrad$	
	7.	Refer applica	to in-plant procedures for comparing the calculated dos able limits that might apply.	e to any

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2.6 <u>De</u> <u>Frc</u>	termining to m Cumula	<u>the Radioiodine and Particulate Dose Το Any Age Groυ ative Releases</u>	ı <u>p's Organ</u>
Dis res day yea org Sev any dos Eff age (X/ the giv clo I&8 and inc is t age any eat	acussion - ulting from ys to ≤7.5 ar. The fol an dose d ction 5.3.1 y age grou se reflects luent Supe e group (se Q) which i rloss of I& en distance ud that aff BDP and H d Tritium. luded (see o calculate e group. T thways that oly to Grass t only milk.	Control 3.11.2.3 limits the dose to the whole body or an the release of I-131, I-133, tritium and particulates with mrem during any calendar quarter and \leq 15 mrem durin lowing calculation method is provided for determining the ue to releases of radioiodines and particulates and is b of NUREG-0133, November 1978. The equations can p provided that the appropriate dose factors are used a only those pathways that are applicable to the age group ervisor will track which age group is the controlling (mose the control 3.11.2.6.c). The (X/Q) _D symbol represents a s different from the Noble Gas (X/Q) in that (X/Q) _D take 8DP and H-3 from the plume as the semi-infinite cloud the. The (D/Q) dispersion factor represents the rate of factors a square meter of ground at various distances from -3 notations refer to I-131, I-133 Particulates having ha For ease of calculations, dose from other lodine nuclide 2.1). Tritium calculations are always based on (X/Q) _D the I&8DP and H-3 dose for each pathway that applie the total dose to an organ can then be determined by s apply to the receptor in the sector. The infant age_group st apply to the receptor in the sector. The infant age_group the pathway dose since they ar	hy organ h half-lives >8 g any calendar he critical ased on be used for and the total- up. The st restrictive) DEPLETED- is into account travels over a allout from the n the site. The lf-lives >8 days es may be . The first step s to a given umming the oup does not e assumed to
Th	e equation	s are:	
Fo	r Inhalation	n Pathway (excluding H-3):	
D ₁₈	_{.8DPT} = Σ3. i	17 X 10 ⁻⁸ Rī (X/Q-) _D Qi	
Fo	r Ground F	Plane, Grass-Cow/Goat-Milk, Grass-Cow/Goat-Milk, or	Vegetation
Dı8	n _{.8DPT} = Σ3. i	17 X 10 ⁻⁸ R _i (D/Q) Q _i	
Fo	r each pat	hway above (excluding Ground Plane) For Tritium:	
DH	- _{3T} = 3	.17 X 10 ⁻⁸ R _{H-3T} (X/Q) _D Q _i	

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			METHODOLOGY SECTION			
2.6	Determining f	the Ra ative F	adioiodine and Particulate Dose To Any Age Grou Releases (continued)	<u>p's Organ</u>		
	For Total Dos group:	se fror	n Particulate Gaseous effluent to organ T of a spe	ecified age		
	$D_{T} = \frac{\Sigma}{Z} [D_{I\&BDP} + D_{H-3}]$					
	Where:					
	Т	=	the <u>organ</u> of interest of a specified age group			
	Z	=	the applicable pathways for the age group of inte	erest		
	D _{I&8DP}	=	Dose in mrem to the organ T of a specified age radioiodines and 8D Particulates	group from		
D _{H-3}		=	Dose in mrem to the organ T of a specified age Tritium	group from		
	D _T	-=	Total Dose in mrem to the organ T of a specified from Gaseous particulate Effluents	l age group		
	ĩΣ	=	A mathematical symbol to signify the operations the symbol are to be performed for each nuclide and the individual nuclide doses are summed to total dose from the pathway of interest to organ	to the right of (i) through (n arrive at the T.		
	Σ Z	н	A mathematical symbol to indicate that the total organ \mp is the sum of each of the pathway dose and H-3 from gaseous particulate effluents.	dose D⊤ to s of I&8DP		
	3.17 X 10 ⁻⁸	=	The inverse of the number of seconds per year year year/sec .	with units of		
	R _i	=	The dose factor for nuclide (i) (or H-3) for pathw T of the specified age group. The units are eithe	ay Z to organ ∋r		
		mrer	$n-m^3$ for pathways OR $mrem-m^2-sec$ for path	ways		

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			METH	HODOLOGY SECTION			
2.6	<u>Deter</u> From	<u>termining the Radioiodine and Particulate Dose To Any Age Group's Organ</u> om Cumulative Releases (continued)					
-	(X/Q) _D		The depleted-(X/Q) value for a specific location where the receptor is located (see discussion). The units are sec/m ³				
	(D/Q)		= the depos is located m=meters	 the deposition value for a specific location where the receptor is located (see discussion). The units are 1/m² where m=meters. 			
	Qi		The numb projected	per of micro-Curies of nuclide (i) releas during the dose calculation exposure	ed (or period.		
	Q _{H-3}		= the number of micro-Curies of H-3-released (or projected)				
Ì		during the dose calculation exposure period.					
	1.	The Inh	alation Dose Pat	hway Method:			
			NOTE				
			The H-3 dose should be calculated as per 2.6.4.				
		A.	Determine the a where the recept (i)	pplicable $(X/Q)_D$ from Table M-2 for the tor is located. This value is common to	e location o each nuclide		
		В.	For the age grou for the organ T a	up(s) of_interest, determine the R _i facto and age group from the appropriate tak	r of nuclide (i)_ ⁻ ble number.		
	[A	\ge Group	Inhalation Dose Factor Table Numb	er -		
			Infant	G-5			
_		-	Child	G-8			
			Teen	G-13-			
			Adult	G-18			
		C.	Obtain the micro waste managem consideration du	p-Curies (Q _i) of nuclide (i) from the radi nent logs for the release source(s) und nring the time interval.	ioactive-gas er		
		D.	Solve for D _I				
			D _i = 3.17 X 10 ⁻⁸ F	Ri(X/Q) _D Qı			
			D _i = n	nrem from nuclide (i)			

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2.6	<u>Deter</u> From	mining 1 Cumula	<u>he Radioiodine and Particulate Dose To Any Age Grou tive Releases</u> (continued)	ıp's Organ			
	1.						
		E.	Perform steps 2.6.1.B through 2.6.1.D for each nuclide during the time interval for each organ.	e (i) reported			
		F.	The Inhalation dose to organ T of the specified age gro determined by summing the D _i Dose of each nuclide (i	oup is)			
			$D_{\text{Inhalation}} = D_1 + D_2 + \dots + D_n = \dots \text{mrem}$ (Age Group)				
			-Refer to 2.6.5 to determine the total dose to-organ T fro radioiodines & 8D Particulates	om			
	2.	The Gro	ound Plane Dose Pathway Method:				
	Tritiur organ	m dose I consid	via the ground plane is zero. The Whole Body is the or ered for the Ground Plane pathway dose.	nly			
-		A.	Determine the applicable (D/Q) from Table M-2 for the the receptor is located. This (D/Q) value is common to (i)	location where each nuclide			
		В.	Determine the Ri factor of nuclide (i) for the whole bod Table G-4. The ground plane pathway dose is the san groups.	y from ne for all age			
-		C.	Obtain the micro-Curies (Qi) of nuclide (i) from the radi waste management logs for the source under consider	ioactive gas ration.			
-		D.	Solve for D ₁				
			$D_i = 3.17 \times 10^{-8} R_i (D/Q) Q_i$				
			D _i = mrem for nuclide (i)				
		E.	Perform steps 2.6.2.B through 2.6.2.D for each nuclide during the time interval.	e (i) reported			

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2.6	Det	ermining	the Radioiodine	and Particulate Dose	To Any Age Grou	p's Organ
	Fro	n Cumul	ative Releases	(continued)		-
	2.	(conti	nued)			
-		F.	The Ground Pl the Di Dose of	ane dose to the whole l each nuclide (i)	body₋is determine	ed by summing
_			D _{Gr.PlWBody} = E	$D_1 + D_2 + \ + D_n =$	mrem	
			Refer to step 2	.6.5 to calculate total de	ose to the Whole	Body.
-	3.	The Gr	ass-Cow/Goat-N	Milk Dose Pathway Met	hod:	
	[NOTE		
			Tritium do	<u>NOTE</u> ose is calculated a s per	2.6.4.	
		В.	the sum of eac milk from only determine whice For the age gro	th animal), as the huma the most restrictive anir th animal is controlling oup(s) of interest, deter	n receptor is ass nal. Refer to Tab based on its (D/C mine the dose fac	umed to drink ole M-3 to)). ctor R _i for
			nuclide (i), for applicable milk	organ T, from the appro animal.	priate table-numl	ber for the
		A	ge Group	Cow Milk Dose Factor Table Number	Goat Milk Do Factor Table Nu	se mber
			Infant	G-6	G-7	
1			Child	G-9	G-10	
			Teen	G- <u>1</u> 4	G-15-	
I			Adult	G-19	G-20	
		C.	Obtain the mic waste manage during the time	ro-Curies (Q _i) of nuclide ment logs for the releas interval.	e (i) from the radi se source under o	oactive gas consideration_
		D.	Solve for D _i			
			D _i = 3.17 X 10 ⁻	⁸ R _i (D/Q)Q _i		
			D _i = mre	em from nuclide (i)		
			•	× /		

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2.6	<u>Dete</u> From	rmining (Cumula	the Radioiodine and Particulate Dose To Any Age Group's Organ ative Releases (continued)			
	3.	(contin	nued)			
		E.	Perform steps-2.6.3.B through 2.6.3-D for each-nuclide (i) reported during the time interval. Only the radioiodines need to be included if the limited analysis approach is used.			
-		F.	The Grass-Cow-Milk (or Grass-Goat-Milk) pathway dose to organ T is determined by summing the Di dose of each nuclide(i).			
			$D_{G-C-M}^{}$ (or D_{G-G-M}) = $D_1 + D_2^{} + D_n = mrem$			
			The dose to each organ should be calculated in the same manner with steps 2.6.3.B through 2.6.3.F. Refer to step 2.6.5 to determine the total dose to organ T from radioiodines &8D Particulates. If the limited analysis approach is being used the infant thyroid dose via the grass-cow(goat)-milk pathway is the only dose that needs to be determined. Section 2.6.5 can be omitted.			
	4.	The Gra	ass-Cow/Goat-Meat Dose Pathway method:			
	NOTE Tritium dose is calculated as per 2.6.6.					
		A.	Determine the controlling herd location by:			
			 For dose calculations (other than the annual report) the historical herd was determined to be located in Sector at miles. This herd shall be used for all ODCM Control required dose calculations. 			
-			2. For annual report dose calculations the herd-from the Land Use Census having the highest (D/Q) at its location will be the reporting herd. The Land Use Census for 1978 (for example) shall apply to the calendar year 1979 (for example) and will locate the nearest herd in each sector over land. The real (D/Q) will be determined from actual met data that occurred during the reporting period.			
		В.	Determine the applicable (D/Q) from Table M-3 for the location(s) of the herd as determined in 2.6.4.A above.			

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2.6	Determining From Cumu	<u>the Radioiodine a</u> lative ₋ Releases (c	and Particulate Dose <u>To Any Age Gro</u> ontinued)	up's Organ
-	4. (cont	inued)		
	C.	Determine the d Table specified I	ose factor Ri for nuclide-(i) for organ t below:	au from the
-		Age	Meat Dose Factor Table No.	
		Infant	N/A *	
		Child	G-1-1	
		Teen	G-16	
		Adult	G-21	
	D.	 The infant of to this path Obtain the micro waste managem nuclide (i) to be consideration du from a_single rel Limits-or annual 	does not eat meat and therefore dose way. o-Curies (Qi) of nuclide (i) from the rac nent logs (for projected doses - the mi projected) for the release source(s) un uring the time interval. The dose can be ease source, but the total dose for OE reports shall be from all gaseous rele	does not apply dioactive gas cro-Curies of nder be calculated DCM Control ase sources.
	E.	Solve for Di		
		Di = 3.17 X 10 F	Ri (D/Q) Qi	_
		Di =	mrem from nuclide (i)	
	F.	Perform Steps 2 during the time i	2.6.4.C through 2.8 . 4.E for each nuclic nterval.	le (i) reported
	G.	The Grass-Cow- summing the Di	-Meat pathway dose to organ tau is de dose of each nuclide (i).	etermined by
		Dose	= D1 + D2 + D3 + + Dn =	mrem
		Grass-Cow-Mea Excluding Tritiur (Child, Teen, or	it n Adult)	

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2.6	<u>Determining</u> From Cumul	<u>the Radioiodine a ative Releases</u> (c	and Particulate Dose To Any Age Grou ontinued)	ip's Organ
	5. The Ve	getation (Garden)) Dose Pathway method:	
	Α.	Determine the co	ontrolling garden location by:	
-		1. For_dose garden wa Control de	calculations (other than annual reports as determined to be located in Sector miles. This garden shall be used fo ose calculations.	s) the historical at or all ODCM
		2. For annua having the reporting_ example) and will lo (D/Q) will during the	al report dose calculations the Land Ca e highest real (D/Q) at its location will garden. The Land Use Census for 19 shall apply to the calendar year 1979 ocate the nearest garden in each sector be determined from actual met data the reporting period.	ensus Garden be the 78 (for (for example) or. The real nat occurred
	В.	Determine the a the garden(s) as	pplicable (D/Q) from Table M-3 for the determined above.	location(s) of
	C.	Determine the de Table specified I	ose factor Ri for nuclide (i) for organ ta below:	au from the
		Age	Vegetation Dose Factor Table No.	
		Infant	N/A *	
		Child	G-12	-
	-	Teen	G-17	
}	F	Adult	G-22	
	-	* denotes the not apply to	e infant does not eat vegetation and th o this pathway.	erefore does
	D.	Obtain the micro waste managem nuclide (i) to be consideration du	p-Curies (Qi) of nuclide-(i) from the rad nent logs (for projected doses - the mic projected) for the release source(s) un uring the time interval. The dose can b	ioactive gas cro-Curies of der e calculated

from a single release source, but the total dose for ODCM Control Limits or annual reports shall be from all gaseous release sources.

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ç	5.	(contin	ued)	
		E.	Solve for Di	
			Di = 3.17 X 10⁻² Ri⁻(D/Q) Qi	
			Di = mrem from nuclide (i)	
		_ F.	Perform Steps 2.6.5.C through 2.6.5.E for each nuclide during the time interval.	e (i) reported
		G.	The Vegetation pathway dose to organ tau is determin summing the Di dose of each nuclide_(i).	ed by
		·	Dose = D1 + D2 + D3 + + Dn =	mrem
			Vegetation (Excluding Tritium) (Child, Teen, or Adult)	
	6.	<u>The G</u>	aseous Tritium Dose (Each-Pathway) Method:	
		A.	The controlling locations for the pathway(s) has alread determined by:	y been
			Inhalation - as per 2.6.1.A Ground Plane - not applicable for H-3 Grass-Cow/Goat-Milk - as per 2.6.3.A Grass-Cow/Goat-Milk - as per 2.6.4.A Vegetation (Garden) - as per 2.6.5.A	
		В.	Tritium dose calculations use the depleted $(X/Q)_D$ insta Table M-2 describes where the $(X/Q)_D$ value should be from.	ead of (D/Q). e obtained

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2.6	<u>Determining the Radioiodine and Particulate Dose To Any Age Group's Organ</u> <u>From Cumulative Releases (</u> continued)										
	6.	(contin	iued)-				•				
Ξ.		C.	For the age factor (R _{H-3} below:	e group(s) of intere) for the organ T o	est, determine the f interest from the	Pathway Tritiun Table∶specified	n dose I ⁻				
		-			MII	LK	-				
			AGE	INHALATION	COW	GOAT					
_			Infant	G-5	G-6	_G-7					
		-	Child	G-8	G-9	G-10					
			Teen	G-13	G-14	G-15					
			Adult	G-18	G-19	G-20					
		D.	Obtain the manageme (i) to be pro during the t release sou reports sha	micro-Curies (Q) o ent logs (for projecto ojected) for the rela- time interval. The arce, but the total o ill be from all gase	of Tritium from the ted doses - the mi ease source(s) un dose can be calco dose for Control lin ous release sourc	e radioactive gas icro-Curies of nu der consideration ulated from a sin mits or quarterly ces.	s waste uclide on ngle				
		E.	Solve for D _{H-3}								
			$D_{H-3} = 3.17 \times 10^{-8} R_{H-3} (X/Q)_D Q$								
			D_{H-3} = mrem from Tritium in the specified pathway for organ T of the specified age group								
-							-				

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2.6 <u>Determining the Radioiodine and Particulate Dose-To Any Age Group's Organ</u> From Cumulative Releases (continued)										
7. <u>Determining the Total Organ Dose From Iodines, 8D-Particulates and H-3</u> From Cumulative Gaseous Releases										
Control dos from the rea	e limits for la actor-unit of	&8DP sha interest.	<u>NOTE</u> all consider	dose-from a	II release s	ources				
А.	The follow organ T_fr release so	ving pathv om a rele ources:	ways shall l ease source	be summed t or if applica	o arrive at ble to Cont	the total dose to rol , f rom all				
Age Group: INFA	NT CHIL	D TEE	En adui	T						
Organ: BONE	LIVER TH	IYROID	KIDNEY	LUNG G	<u>I-LLI WH</u>	IOLE BODY				
PATHW	 Υ	D	OSE	Reference to No.	o STEP	Remark				
Inhalation (1	&8DP)			2.6.1.	F					
Inhalation (T	ritium)			2.6.6.	E					
Ground Plane	(I&8DP)			2.6.2.F						
GrassI	Milk (I&8DP)			2.6.3.F						
Grass-	/ilk (Tritium)			2.6.6.	E					
GrassN	leat (I&8DP)	1		2.6.4.	G	N/A for INFANT				
 Grass	leat (Tritium)			2.6.6.	E -	N/A for INFANT				
Vegetable Garde	en (1&8DP)			2.6.5.	G	N/A for INFANT				
Vegetable Garde	n (Tritium)		<u> </u>	2.6.6.	E	N/A for INFANT				
Dose _T :	=	(sum	of above)	-						
В.	The dose calculated	to each c	of the applic	able age gro	oup's ORG	ANS shall be				
	BONE, LI	VER, TH	YROID, KIE	ONEY, LUNG	, WHOLE	BODY, & GI-LLI				
	The age g Control ⁻ Lia from the ra	roup org mit is the adioiodin	an receiving most critic e & 8D Par	g the highest al organ for t ticulates gas	exposure hat age gro eous efflue	relative to its oup resulting ents.				

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2.7	Proje	cting Do	ose for Radioactive Gaseous Effluents					
	Discu to red gased BOUI and 0 deten calcu	<u>ssion</u> (luce rele bus efflu NDARY .4 mrad mining t lations p	Control 3.11.2.4 requires that the waste gas holdup systeases of radioactivity when the projected doses in 31 date the releases, from each unit, to areas at and beyond the (see TS Figure 5-1-1) would exceed 0.2 mrad for gammer for beta radiation. The following calculation method is he projected doses. This method is based on using the performed in Sections 2.4 and 2.5.	tem be used ays due to e SITE na radiation provided for e results of the				
	1.	Obtain (Sectio can be	the latest results of the monthly calculations of the gam on 2 :4) and the beta air dose if performed (Section 2.5). obtained from the in-plant records.	nma air dose These doses				
- 	2.	-Divide the mo	These doses by the number of days the plant was oper onth.	ational-during				
	3. Multiply the quotient by the number of days the plant is projected to be operational during the next month. The product is the projected dose to next month. The value should be adjusted as needed to account for a changes in failed-fuel or other identifiable operating conditions that cousignificantly alter the actual releases.							
	4.	lf the p air dos be use	projected doses are >0.2 mrads gamm a air dose or > 0. se, the appropriate subsystems of the waste gas holdup ed.	4 mrads beta system shall				
- 3.0	<u>40 CF</u>	R 190 -	Dese-Evaluation					
-	<u>Discu</u> cycle thyroi The fo dose	<u>Discussion</u> - Dose or dose commitment to a real individual from all uranium fuel cycle sources be limited to \leq 25 mrem to the whole body or any organ (except thyroid, which is limited to \leq 75 mrem) over a period of 12 consecutive months. The following approach should be used to demonstrate compliance with these dose limits. This_approach is based on NUREG-0133, Section 3.8.						
3.1	<u>Evalu</u>	ation Ba	ases					
	Dose be pe twice 3.11.2 whole gamn from evalu	Dose evaluations to demonstrate compliance with the above dose limits need only be performed if the quarterly doses calculated in Sections 1.4, 2.4 and 2.6 exceed twice the dose limits of Controls 3.11.1.2.a, 3.11.1.2.b, 3.11.2.2a, 3.1.2.2b, 3.11.2.3a and 3.11.2.3b respectively; i.e., quarterly doses exceeding 3 mrem to the whole body (liquid releases), 10 mrem to any organ (liquid releases), 10 mrads gamma air dose, 20 mrads beta air dose or 15 mrem to the thyroid or any organ from radioiodines and particulates (atmospheric releases). Otherwise, no evaluations are required and the remainder of this section can be omitted.						

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		METHODOLOGY SECTION					
3.2	Doses Fro	m Liquid Releases					
-	For the eva calculation realistic as shellfish by Radiologic more realis levels of pl	aluation of doses to real individuals from liquid releases, for method as employed in Section 1.4 will be used. However, sumptions will be made concerning the dilution and ingest y individuals who live and fish in the area. Also, the result cal Environmental Monitoring program will be included in or stic dose to these real people by providing data-on actual lant related radionuclides in the environment.	the same ver, more stion of fish ar ts of the letermining measured				
3.3	Doses From Atmospheric Releases						
	dose factor sequence	4, the total body dose factor (K _i) should be substituted for or (M _i) to determine the total body-dose. Otherwise the sa applies However more realistic assumptions will be ma	the gamma a me calculatio de concernin				
	the actual consumptio (Control 3. the results in determin measured	location of real individuals, the meteorological conditions ion of food (e.g., milk). Data obtained from the latest land .12.2) should be used to determine locations for evaluating of the Radiological Environmental Monitoring program w ning more realistic doses to these real people by providing levels of radioactivity and radiation at locations of interest	and the use census g doses. Als ill be included g data on actu t.				
-	the actual consumption (Control 3. the results in determin measured	location of real individuals, the meteorological conditions ion of food (e.g., milk). Data obtained from the latest land .12.2) should be used to determine locations for evaluatin of the Radiological Environmental Monitoring program w ning more realistic doses to these real people by providing levels of radioactivity and radiation at locations of interes	and the use census g doses. Als ill be included g data on actu t.				
	the actual consumption (Control 3. the results in determin measured	location of real individuals, the meteorological conditions ion of food (e.g., milk). Data obtained from the latest land .12.2) should be used to determine locations for evaluatin of the Radiological Environmental Monitoring program w ning more realistic doses to these real people by providing levels of radioactivity and radiation at locations of interes	and the use census g doses. Als ill be included g data on acti t.				
-	the actual consumption (Control 3. the results in determine measured	location of real individuals, the meteorological conditions ion of food (e.g., milk). Data obtained from the latest land .12.2) should be used to determine locations for evaluatin s of the Radiological Environmental Monitoring program w ning more realistic doses to these real people by providing levels of radioactivity and radiation at locations of interes	and the use census g doses. Als ill be included g data on acti t.				
	the actual consumption (Control 3. the results in determine measured	location of real individuals, the meteorological conditions ion of food (e.g., milk). Data obtained from the latest land .12.2) should be used to determine locations for evaluatin of the Radiological Environmental Monitoring program w ning more realistic doses to these real people by providin levels of radioactivity and radiation at locations of interes	and the use census g doses. Als ill be included g data on actu t.				
	the actual consumptio (Control 3. the results in determin measured	location of real individuals, the meteorological conditions ion of food (e.g., milk). Data obtained from the latest land .12.2) should be used to determine locations for evaluatin of the Radiological Environmental Monitoring program w ning more realistic doses to these real people by providing levels of radioactivity and radiation at locations of interes	and the use census g doses. Also ill be included g data on actu t.				
	the actual consumptio (Control 3. the results in determir measured	location of real individuals, the meteorological conditions ion of food (e.g., milk). Data obtained from the latest land .12.2) should be used to determine locations for evaluatin of the Radiological Environmental Monitoring program w ning more realistic doses to these real people by providin levels of radioactivity and radiation at locations of interes	and the use census g doses. Also ill be included g data on actu t.				

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			•	METHODOLOGY SECTION				
4.0	<u>Annu</u>							
-	Discussion - The information contained in a annual report shall not apply to any Control. The reported values are based on actual release conditions instead of historical conditions that the Control dose calculations are based on. The Control dose limits are therefore included in item 1 of the report, for information only. The ECLs-in item 2 of the report shall be those listed in Tables L-1 and G-1 of this manual. The average energy in item 3 of the report is not applicable to the- St. Lucie Plant. The format, order of nuclides and any values shown as an example in Tables 3.3 through 3.8 are samples only. Other formats are acceptable if they contain equivalent information. A table of contents should also accompany -the report. The following format should be used:							
		RADIO	ACTIV	<u> /E EFFLUENTS - SUPPLEMENTAL INFORMAT</u>	- <u></u>			
	1.	Regula	atory L	imits:				
		1.1	For R	adioactive liquid waste effluents:				
			a.	The concentration of radioactive material releases site (see TS Figure 5.1-1) shall be limited to ter concentrations specified in 10 CFR Part 20.100 Appendix B, Table-2, Column 2 for radionuclided dissolved or entrained noble gases. For dissolved number of the concentration shall a 2 X $10^{-4} \mu$ Ci/ml total activity.	sed from the times the 1-20.2401, es other than ved or be limited to			
			b.	The dose or dose commitment to a MEMBER of from radioactive materials in liquid effluents relative reactor unit to unrestricted areas (See TS Fig. 4) limited during any calendar quarter to \leq 1.5-mre body and to \leq 5 mrem to any organ and \leq 3 mre body and \leq 10-mrem to any organ during any calendar quarter to \leq	DF THE PUBLIC eased from each 5.1-1) shall be m to the whole m to⁻the whole alendar year.			
		1.2	For R	adioactive Gaseous Waste Effluents:				
			a.	The dose rate resulting from radioactive materi gaseous effluents to areas at or beyond the SI (See TS Figure 5.1-1) shall be limited to the fol	als released in ΓE BOUNDARY lowing values:			
				The dose rate limit for noble gases shall be \leq 50 the total body and \leq 3000 mrem/yr to the skin a	00 mrem/yr to nd			
				The dose rate limit from I-131, I-133, Tritium ar with half-lives >8 days shall be \leq 1500 mrem/yr	nd particulates to any organ.			
1								

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4.0	<u>Annu</u>	al Radio	oactive	e Effluent Report (continued)	
	1.	(contir	nued)		
		1.2	(cont	inued)	
			b.	The air dose (see TS Figure 5.1-1) due to noble released in gaseous effluents, from each reacto at and beyond the SITE BOUNDARY shall be li following:	e gases or unit, to areas mited to the
-				During any calendar quarter, to ≤ 5 mrad for gar and ≤ 10 mrad for beta radiation and during any to ≤ 10 mrad for gamma radiation and ≤ 20 mrac radiation	nma radiation calendar year l for beta
			С.	The dose to a MEMBER OF THE PUBLIC from Tritium and all radionuclide in particulate form, v >8 days in gaseous effluents released from eac to areas at and beyond the SITE BOUNDARY (1 in the TS-A) shall be limited to the following:	I-131, I-133, with half-lives h reactor unit see Figure 5.1-
				During any calendar quarter to \leq 7.5 mrem to ar during any calendar year to \leq 15 mrem to any o	iy organ and rgan.
	2.	Efflue	nt Lim	iting Concentrations:	
		Air - a	s per a	attached Table G-1	
		Water	- as-p	per attached Table L-1	-:
	3.	Avera applic	ge en able to	ergy of fission and activation gases in gaseous ef o the StEucie Plant.	fluents is not

			PROCEDURE II	16.5.				PAGE.			
	50	<u>.</u>	OFFSITE DOSE CALCULATION MANUAL (ODCM) 140 of 231								
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			<u>r</u>	METHOD	OLOGY	SECTION	Ł				
4:0	Annual Radioactive Effluent Report (continued)										
	4.	Measu	rements and	d Approx	imations	of Total R	adioactivit	y:			
		A sum	mary of liqui	d effluen	t accour	iting metho	ds is desc	ribed-in Ta	able 3.1.		
		A summary of gaseous effluent accounting methods is described in Table 3.2.									
		Estimate of Errors:									
					LIG		GASE	EOUS			
		Erro	Торіс	_	Avg. %	Max. %	Avg. %	Max. %			
	R	elease F	oint Mixing		2	5	NA	NA			
	S	ampling			1	5	2	5			
	S	ample P	reparation		1	5	1	5			
	S	ample A	nalysis		3	10	3	10			
	R	elease V	olume		2	5	4	15			
				Total %	9	30	10	35			
					(above	e values ar	e example	es only)			
		The pr -nuclide near b could e	edictability c es that are p ackground r easily have e	of error fo redomina elative to errors gre	r radioa ant in sa the <u>p</u> rec ater tha	ctive releas mple spect dominant n n the above	ses can-on rums. Nuo uclides in e listed ma	ly be appli clides that a_given-sa aximums.	ed to are mple		

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4.0 <u>Annual Ra</u>	idioactive Effluent Report	(continued)						
4. (co	ntinued)							
RAT		BLE 3.1 UENT SAMPI ING AND ANALYS	SIS					
LIQUID SOURCE	SAMPLING FREQUENCY	TYPE OF ANALYSIS	METHOD OF ANALYSIS					
LIQUID SOURCE	SAMPLING FREQUENCY EACH BATCH	TYPE OF ANALYSIS PRINCIPAL GAMMA EMITTERS	METHOD OF ANALYSIS p.h.a.					
LIQUID SOURCE MONITOR	SAMPLING FREQUENCY EACH BATCH	TYPE OF ANALYSIS PRINCIPAL GAMMA EMITTERS TRITIUM	METHOD OF ANALYSIS p.h.a. L.S.					
LIQUID SOURCE MONITOR TANK RELEASES	SAMPLING FREQUENCY EACH BATCH MONTHLY COMPOSITE	TYPE OF ANALYSIS PRINCIPAL GAMMA EMITTERS TRITIUM GROSS AEPHA	METHOD OF ANALYSIS p.h.a. L.S. A.I.C.					
LIQUID SOURCE MONITOR TANK RELEASES	SAMPLING FREQUENCY EACH BATCH MONTHLY COMPOSITE QUARTERLY COMPOSITE	TYPE OF ANALYSIS PRINCIPAL GAMMA EMITTERS TRITIUM GROSS ALPHA Sr-89, Sr-90, Fe-55	METHOD OF ANALYSIS p.h.a. L.S. A.I.C. C.S.					
LIQUID SOURCE MONITOR TANK RELEASES STEAM	SAMPLING FREQUENCY EACH BATCH MONTHLY COMPOSITE QUARTERLY COMPOSITE FOUR PER MONTH	TYPE OF ANALYSIS PRINCIPAL GAMMA EMITTERS TRITIUM GROSS ALPHA Sr-89, Sr-90 , Fe-55 PRINCIPAL GAMMA EMITTERS AND DISSOLVED GASES	METHOD OF ANALYSIS p.h.a. L.S. A.I.C. C.S. p.h.a.					
LIQUID SOURCE MONITOR TANK RELEASES STEAM GENERATOR BLOWDOWN	SAMPLING FREQUENCY EACH BATCH MONTHLY COMPOSITE QUARTERLY COMPOSITE FOUR PER MONTH	TYPE OF ANALYSIS PRINCIPAL GAMMA EMITTERS TRITIUM GROSS ALPHA Sr-89, Sr-90, Fe-55 PRINCIPAL GAMMA EMITTERS AND DISSOLVED GASES TRITIUM	METHOD OF ANALYSIS p.h.a. L.S. A.I.C. C.S. p.h.a. L.S.					
LIQUID SOURCE MONITOR TANK RELEASES STEAM GENERATOR BLOWDOWN RELEASES	SAMPLING FREQUENCY EACH BATCH MONTHLY COMPOSITE QUARTERLY COMPOSITE FOUR PER MONTH MONTHLY COMPOSITE	TYPE OF ANALYSIS PRINCIPAL GAMMA EMITTERS TRITIUM GROSS ALPHA Sr-89, Sr-90 , Fe-55 PRINCIPAL GAMMA EMITTERS AND DISSOLVED GASES TRITIUM GROSS ALPHA	METHOD OF ANALYSIS p.h.a. L.S. A.I.C. C.S. p.h.a. L.S. A.I.C.					

TABLE NOTATION:

p.h.a. - gamma spectrum pulse height analysis using High Purity Germanium (HPGE) detectors. All peaks are identified and quantified.

L.S. - Liquid Scintillation counting

C.S. - Chemical Separation

A.I.C. - Air Ion Chamber

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4.0 <u>Annual Radioactive Effluent Report</u> (continued)								
4. (cont	inued)							
RADI	<u>TA</u> DACTIVE GASEOUS W	<u>BLE 3.2</u> ASTE SAMPLING AND AN	ALYSIS					
GASEOUS SOURCE	SAMPLING FREQUENCY	TYPE OF ANALYSIS	METHOD OF ANALYSIS					
Waste Gas Decay Tank Releases	Each Tank	Principal Gamma Emitters	G, p.h.a.					
Containment	Each-Purge	Principal-Gamma Emitters	G, p.h.a.					
Purge Releases		-H-3	L.S.					
	Four per Month	Principal Gamma Emitters	(G, C, P) - p.h.a.					
		H-3	L.S.					
Plant Vent	Monthly Composite (Particulates)	Gross Alpha	P - A.I.C.					
	Quarterly Composite (Particulates)	Sr-90 Sr-89	C.S.					
		Principal Gamma Emitters	(G, C, P) - p.h.a.					
1 1	\A/a aldur	-						
	Weekly	H-3	L.S.					
Cask Handling Facility Vent (1)-	Weekly_ Monthly Composite _(Particulate)	H-3 Gross Alpha	L.S. P - A.I.C.					

TABLE NOTATION:

- G Gaseous Grab Sample
- C Charcoal Filter Sample
- P Particulate Filter Sample
- L.S. Liquid Scintillation Counting
- C.S. Chemical Separation
- p.h.a. Gamma spectrum pulse height analysis using High Purity Germanium(HPGE)detectors. All peaks are identified and quantified.

A.I.C. - Air Ion Chamber

(1)----Only required when operating.

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				METHODOLOGY SECTION	
4.0	Annua	al Radio	oactive	<u>e Effluent Report</u> (continued)	
	5.	Batch	Relea	ses	
		A.	Liquio	1	
			1.	Number of batch releases:	
			2.	Total time period of batch releases:	minutes
			3.	Maximum time period for a batch release:	minutes
_			4.	Average time period for a batch-release:	minutes
			5.	Minimum time period for a batch-release:	minutes
			6.	Average_dilution stream-flow during the period (see Note 1 on Table 3.3):	GPM
			A	Il liquid releases are summarized in tables	
		В.	Gase	ous	
-			1.	Number of batch releases:	
			2.	Total time period for batch releases:	minutes
			3.	Maximum time period for a batch release:	minutes
			4.	Average time period for batch releases:	minutes
_			5.	Minimum time period for a batch release:	minutes
		1	All gas	eous waste releases are summarized in tables	

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				METHODOLOGY SECTION					
4.0	<u>Annu</u>	al Radic	active	Effluent Report (continued)					
_	6.	Unplar	nned F	Releases					
		A.	Liquic	1	-				
			1.	Number of releases:					
			2.	Total activity releases:	Curies				
		B.	Gase	ous					
-			1.	Number of releases:					
			2.	Total activity released:	Curies				
	С.		See a	attachments (if applicable) for:					
			1.	A description of the event and equipment involv	red.				
			2.	Cause(s) for the unplanned release.					
			3.	Actions taken to prevent a recurrence					
			4.	Consequences of the unplanned release					
	7.	Descri to the Janua	ption gener ry ann	of dose assessment of radiation dose from radioa al public due to their activities inside the site are n ual report.	active effluents reported on the				
	8.	Offsite period	ite dose calculation manual revisions initiated during this reporting od. See Control 3.11.2.6 for required attachments to the Annual Report.						
	9.	Solid v Contro	waste and irradiated fuel shipments as per requirements of ol 3.11.2.6.						
	10.	Proces	ss Cor	ntrol Program (PCP) revisions as_per requiremen	ts of TS 6.13.				
	11.	Major Syster	Major changes to Radioactive Liquid, Gaseous and Solid Waste Treatment Systems as per requirements of Control 3.11.2.5.						
	12.	Result INITIA been i	s of w TIVE ncorpo	rater samples taken in support of the Groundwate (NEI 07-07) during the previous calendar year th orated into the Radiological Environmental Monite	er Protection at have not oring Program.				
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			<u>M</u>	ETHODOLOG	SY SEC	TION			
			FLORID	A POWER &	LIGHT	СОМРА	ŧΝΥ		
				ST. LUCIE UN	NIT #				
		ANNUA	L REPORT -		ŢΗ	ROUGH	1 1		
	TA	ABLE 3.	3: LIQUID EF	FLUENTS - S	SUMM/		F ALL RELE	ASES	
А.	Fissio	on and A	ctivation Prod	ducts		<u>UNIT</u>	<u>QUARTER</u>	<u># QUA</u>	RTER #
	1.	Total F Gases	Release - (No , Alpha)	t including Trit	ium,	Ci	E		E
	2.	Averag Period	ge Diluted Co	ncentration Du	rring	μCi/ml	E		E
В.	Tritiur	n							_
	1.	Total F	Release			Ci	E		E
	2.	Averaç Period	ge Diluted Co	ncentration Du	uring	μCi/ml	E		E
C.	Disso	lved an	d Entrained G	ases					_
	1.	Total F	Release			Ci	E		E .
	2.	Averaç Period	ge Diluted Co	ncentration Du	uring	μCi/ml	E		Е
D.	Gross	s Alpha	Radioactivity						
	1.	Total F	Release			Ci	E		E
E.	Volun (Prior	ne of W	aste Release ion)	d		LITERS	E		E
F.	Volūn Used	ne of Di During	lution Water Period ¹			LITERS	E		E
1 -	The vol during dilution	lume re release stream	ported should intervals. Th flow during th	be for the ent is volume sho ne period.	ire inte uld also	rval of th be used	e reporting p d to calculate	eriod, r e averag	not just je

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AODE UARTER # E E E
- MODE MARTER # E E E
AODE VUARTER # E E E
10DE 10ARTER # E E E
AODE NUARTER # E E E
IODE UARTER # E E E
10DE 1UARTER # E E E
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* All nuclides that were detected should be added to the partial list of the example format.

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TABLE 3.4: LIQUID EFFLUENTS (EXAMPLE FORMAT) (continued)

		CONTINUC	DUS MODE	BATCH MODE	
		_QUARTER #	QUARTER #	QUARTER #	QUARTER #
CE-144	CI	E	E	E	Ē
SR-89	CI	E	Έ	E	· E
SR-90	CI	E	E	E	E
UNIDENTIFIED	CI	E	E	E	E
TOTAL FOR PERIOD (ABOVE)	CI	E	E	E	E

		CONTINUC	DUS MODE	BATCH MODE		
	UNIT	QUARTER #	QUARTER #	QUARTER #	QUARTER #	
AR-41	Cl	E	E	E	Е	
KR-85	Cl	E	E	E	Е	
XE-131M	CI	Ε	E	E	E	
XE-133	CI	E	E	E	Е	
XE-133M	Cī⊤	E	E	E	Έ	
XE-135	CI	E	E	E	E	

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	FLORIDA POWER &	LIGHT COMPANY					
	ST. LUCIE UN	NT #					
TA	BLE 3.5: LIQUID EFFLUE	NTS - DOSE SUMMATION					
Ag	e Group: Lo	ocation:					
Exposure	nterval: From	Through					
Fish &	Shellfish Pathway to Organ	CALENDAR YEAR DOSE (m	irem)				
-	BONE	· · · · ·					
	LIVER						
	THYROID						
KIDNEY							
	LUNG						
	GI-LLI						
	WHOLE BODY						

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			FLORIDA PO'	WER & LIG	HT COMPAN	Y		
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		ANÑI	JAL REPORT	_!!	_ THROUGH	/	<u> </u>	
ĺ	-	FABLE 3.	6: GASEOUS EFF	LUENTS - S	SUMMATION	OF ALL R	ELEASE	S
-							# 0114	
Δ	Fissi	ion and A	Activation Gases		<u>UNI </u>	UARIER		
,	4				0;	F		_
Ť	1.	Iotal F	<elease-< td=""><td></td><td>CI</td><td><u>~</u>Ę</td><td><u> </u></td><td>E</td></elease-<>		CI	<u>~</u> Ę	<u> </u>	E
	2.	Avera	je Release Rate Fo	r Period-	μCi/SEC	E		E
В.	lodir	nes						
	1.	Total I	odine-131		Ci	E	<u> </u>	E
	2.	Avera	ge Release Rate for	Period	μCi/SEC	E	:	E
C.	Parti	iculates						
	1.	Particu	ılat <u>es</u> T-1/2 > 8 Day	'S	Ci	E		E
	2.	-Avera	ge Release Rate for	Period-	μCi/SEC	E	<u> </u>	E
	3.	Gross	Alpha Radioactivity		Ci	E	i	E
D.	Tritiu	ım						
	1.	Total F	Release		Ci	E	<u> </u>	E
	2.	Avera	ge Release Rate for	Period	μCi/SEC	E	E	E.
1								

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		ST. L	UCIE UNIT #	£				
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TABLE 3.	.7: GASE	OUS EFI (EX	FLUENTS - C AMPLE FOR	€ROUND LE\ MAT)	VEL RELEAS	SES		
			CONTINUC	OUS MODE	BATCH	MODE		
	ASED*	UNIT	QUARTER #	QUARTER #	QUARTER #	QUARTER #		
1. Fission Gases	d		l		I	· · ·		
AR-41		Ci⁻	E	E	E	E-		
KR-85		CI	E	E	E	E		
KR-85M⁻		CI	E	E	Ē	E		
KR-87		CI	E	E	E	E		
KR-88		CI	E	E	E	E		
XE-131M		CI	E	E	E	E		
XE-133		CI	E	E	E	E		
XE-133M		Cl	E	E	E	E		
XE-135		CI	E	E	E	E		
XE-135M		CI	E	E	E	E		
XE-138		CI	E	E	E	E		
UNIDENTIFIE	ED	εı	E	E	E	E		
TOTAL FOR PE (ABOVE)	RIOD	CI	E	E	E	E		
2. lodines					.			
I-131		CI	E	E	E	E		
l-133		CI	E	E	E	E		
- I-135		CI	E	EE	E	E		
TOTAL FOR PE (ABOVE)	RIOD	CI	E	E	E	E		
3. Particulates								
CO-58		CI	E	E	E	E		
SR-89		CI	E	E	E	E		
CD 00						-		

* All nuclides that were detected should be added to the partial list of the example format.

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			FLORIDA	POWER & L	IGHT COMP	ANY			Controlling
			S	LUCIE UNI	Т#				
	TABI	LE 3.8: GAS	EOUS EFFL	JENTS - DOS	SE SUMMAT	IÒN - CALEN	IDAR YEAR		
Д — Д	AGE GROUF	P: <u>INFAN[\]T</u>	EXPOSUR		.: FROM	THF	ROUGH		
PATI	HWAY	BONE		THYROID	KIDNEY	LUNG	GI-LLI (mrom)	WHOLE BODY]
Ground Pla	ne (A)						(milen)		-
Grass	Milk (B)		·				· · · ·		
Inhalation	(A)			· · · · · · · · · · · · · · · · · · ·		<u> </u>			-
	- ·=· i		·	I	. <u></u>]		<u> </u>	1
A) SECT	OR:	RANGE:	miles	(B) CO	W/GOAT	SECTOR:	RAN	IGE: miles]
			SES			orad)			
		Gamma Air	Dose	O' LEITE					
		Beta Air Do	ose			1			
	Sector:			Range:		· · · · · · · · · · · · · · · · · · ·	0.97 mile	s	
 				······		;	······································	—————	
		uon abovo w	oro caldulato	<u>NOTE</u>	Imotoorologi	ical data durir	na tha anacifi	od	
	ime interval	with MET dat	a reduced as	s per Reg. Gu	ide 1.111. Ma	arch 1976.	ng the specifi	eu	
<u>L</u>				<u> </u>	··· =	······		<u></u>	

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ST. LUCIE PLANT

TABLE L-1

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EFFLUENT CONCENTRATION LIMITS IN WATER IN UNRESTRICTED AREAS

NOTE

If a nuclide is not listed below, refer to 10 CFR Part 20, Appendix B, Table 2 Effluent Concentrations Column 2 and use the most conservative ECL listed for the nuclide.

Nuclide	ECL (µCi/ml)	Nuclide	ECL (µCi/ml)	Nuclide	ECL (µCi/ml)
H-3	- 1 E-3	Sr-92	4 E-5	Te=129	4_E-4-
C-14	3 E-5	Y-90	7 E-6	Te-131m	8 E-6
⁻Na-24	5 E-5	– Y-91m ⁻	2 E-3	Te-131	8 E-5
P-32	9 E-6	Y-91	8 E-6	Te-132	9-E-6
Cr-51	5 E-4	Y-92	- 4 E-5	I-130	2 E-5
_™in-54	3 E-5	Y-93	2 E-5	I-131	1 E-6
Mn-56	7 E-5	Zr-95	2 E-5	I-132	1 E-4
Fe-55	1 E-4	Zr-97	9 E-6	I-133	7 E-6
Fe-59	1 E-5	Nb-95	3 E-5	I-134	4 E-4
Co-57	6 E-5	Nb-97	3 E-4	I-135	3 E-5
Co-58	2 E-5	Mo-99	2 E-5	Cs-134	9 E-7
Co-60	_3 E-6	Tc-99m	1 E-3	Cs-136	6 E-6
Ni-63	1 E-4	Tc-101	2 E-3	-Cs-137	1 E-6
Ni-65	1 E-4	Ru-103	3 E-5	Cs-138	4 E-4
Cu-64	2 E-4	Ru-105	7 E-5	Ba-139	2 E-4
Zn-65	.5 E-6	Ru-106	3 E-6	Ba-140	8 E-6-
Zn-69	8 E-4	Ag-110	6 E-6	Ba-141	3 E-4
Br-82	4 E-5	Sn-113	3 E-5	Ba-142	- 7 E-4
Br-83	9 E-4	ln-113m	7 E-4	La-140	9 E-6
Br-84	4 E-4	Sb-122	1 E-5	Ľa-142	1 E-4
Rb-86	7 E-6	Sb-124	7 E-6	Ce-141	3 E-5
Rb-88	4-E-4	Sb-125	3 E-5	Ce-143	2 E-5
Rb-89	9 E-4	Te-125m	2 E-5	Ce-144	3₋E-6
Sr-89	8 E-6	Te-127m	9 E-6	Pr-144	6 E-4
Sr-90	5 E-7	Te-127	1 E-4	W-187	3 E-5
Sr-91	2 E-5 -	Te-129m	7 E-6	Np-239	2 E-5

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				 E _2			
	ENVIRONMEN		-DOSE CONVE		RS FOR LIQUID	DISCHARGES	
	PATHW/	AY - SALT WAT	ER FISH AND !	SHELLFISH	AGE GROUP	- ADULT	
	•	ORGAN D	OSE FACTOR	(MREM/HR PI	ER μCi/ML)	*	
				· · ·			·,
NUCLIDE	BONE	LIVER	THYROID	KIDŅEY	LUNG	GI-LLI	WHOLE BODY
H-3	0.	3.60E-01	3.60E-01	3.60E-01	3.60E-01	3.60E-01	3.60E-01
C-14	1.45E+04	2,91E+03	2.91E+03	2.91E+03	2.91E+03	2.91E+03	2.91E+03
NA-24	6.08E-01	6.08E-01	6.08E-01	6.08E-01	6.08E-01	6.08E-01	6.08E-01
P-32	1,67E+07	1.05E+06	0.	0.	0.	1.88E+06	6,47E+05
CR-51	0.	0.	3.34E+00	1.23E+00	7.42E+00	1.41E+03	5.59E+00
MN-54	0.	7.07E+03	0.	2.10E+03	0.	2.17E+04	1.35E+03
MN-56	0.	1.78E+02	0.	2.26E+02	0.	5.68E+03	3.17E+01
FE-55	1.15E+05	5.19E+05	0.	0.	6.01E+05	2.03E+05	1.36E+05
FE-59	8.08E+04	1.92E+05	0.	0.	5.32E+04	6.33E+05	7.29E+04
CO-57	0.	1.42Ė+02	0.	0.	0.	3.60E+03	2.36E+02
CO-58	0.	6.05E+02	0.	0.	0.	1.22E+04	1.35E+03
CO-60	0.	1.74E+03	0.	0.	0.	3.26E+04	3.83E+03
Ni-63	4.97E+04	3.45E+03	0.	0.	0.	7.19E+02	1.67E+03
NI-65	2.02E+02	2.63E+01	0.	0.	0.	6.65E+02	1.20E+01
CU-64	0.	2.15E+02	0.	5.41E+02	0.	1.83E+04	1.01E+02
ZN-65	1.62E+05	5.13E+05	0.	3.43E+05	0.	3.23E+05	2.32E+05
ZN-69	3.43E+02	6.60E+02	0.	4.27E+02	0.	9.87E+01	4.57E+01

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C-200			ST. LU	JCIE PLANT			
	ENVIRONMEN			LE L-2 ERSION FACTO			
	PATHW	AY - SALT WA	TER FISH AND	SHELLFISH	AGE GROU	P - ADULT	
	-1	ORGAN [DOSE FACTOR	(MREM/HR F	PER μCi/ML)		
			·	· · ·	· · ·		
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
BR-82	0.	0.	0.	0.	0.	4.68E+00	4.08E+00
BR-83	0.	0.	0.	0.	0.	1.05E-01	7.26E-02
BR-84	0.	0.	0.	0.	0.	7.38E-07	9.42E-02
BR-85	0.	0.	Q.	0.	0.	0.	3.86E-03
RB-86	0.	6.25E+02	0.	0.	0.	1.23E+02	2.91E+02
RB-88	0.	1.79E+00	0.	0.	0.	0.	9.50E-01
RB-89	0.	1.19E+00	0.	0.	0.	0.	8.38E-01
SR-89	5.01E+03	0.	Q.	0.	0.	8.01E+02	1.44E+02
SR-90	1.23E+05	0.	0.	0.	0.	1.65E+03	3.02E+04
SR-91	9.43E+01	0.	0.	0.	0.	4.75E+02	4.15E+00
SR-92	3.50E+01	0.	<u></u> .	0.	0.	6.91E+02	1.51E+00
Y-90	6.07E+00	0.	0.	0.	0.	6.43E+04	1.63E-01
Y-91M	5.74E-02	0.	0.	0.	0.	1.68E-01	2.23E-03
Y-91	8.89E+01	0.	0.	0.	0.	4.89E+04	2.38E+00
Y-92	5.34E-01	0.	0.	0.	0.	9.33E+03	1.56E-02

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	TABLE L-2 ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES									
	PATHW	AY - SALT WAT ORGAN [TER FISH AND DOSE FACTOR	SHELLFISH (MREM/HR P	AGE GROUP ER μCi/ML)	P-ADULT	· ·			
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY			
Y-93	1.69E+00	0.	0.	0.	0.	5.36E+04	4.67E-02			
ZR-95	1.60E+01	5.13E+00	0.	8.09E+00	0.	1.59E+04	3.47E+00			
ZR-97	8.82E-01	1.78E-01	0.	2.69E-01	0.	5.51E+04	8.19E-02			
NB-95	4.48E+02	2.49E+02	0.	2.47E+02	0.	1.51E+06	9.79E+01			
NB-97	3.76E+00	9.50E-01	Q.	1.11E+00	0.	3.51E+03	3.47E-01			
MO-99	0.	1.28E+02	Ö.	2.90E+02	0.	2.97E+02	2.43E+01			
TC-99M	1.30E-02	3.67E-02	0.	5.57E-01	1.80E-02	2.17E+01	4.67E-01			
TC-101	1.33E-02	1.93E-02	0.	3.47E-01	9.82E-03	0,	1.89E-01			
RU-103	1.07E+02	0.	0.	4.09E+02	0.	1.25E+04	4.61E+01			
RU-105	8.90E+00	0.	Ò.	1.15E+02	0.	5.44E+03	3.51E+00			
RU-106	1.59E+03	0.	0.	3.08E+03	0.	1.03E+05	2.01E+02			
AG-110	1.57E+03	1.45E+03	0.	2.85E+03	0.	5.92E+05	8.62E+02			
SB-124	2.78E+02	5.23E+00	6.71E-01	0.	2.15E+02	7.85E+03	1.10E+02			
SB-125	2.20E+02	2.37E+00	1.96E-01	0.	2.30E+04	1.95E+03	4.42E+01			
TE-125M	2.17E+02	7.89E+01	6.54E+01	8.83E+02	0.	8.67E+02	2.91E+01			

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	ENVIRONMEN			ERSION FACTO	RS FOR LIQUID		
	PATHW	AY - SALT WAT	FISH AND	SHELLFISH	AGE GROUP	- ADULT	
		ORGAN [DOSE FACTOR	(MREM/HR PI	ER μCi/ML)		
	· · · · · · · · · · · · · · · · · · ·					,	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	ĢI-LLI	WHOLE BODY
TE-127M	5.50E+02	1.92E+02	1.40E+02	2.23E+03	0.	1.84E+03	6.70E+01
TE-127	8.92E+00	3.20E+00	6.61E+00	3.63E+01	0.	7.04E+02	1.93E+00
TE-129M	9.32E+02	3.49E+02	3.20E+02	3.89E+03	0.	4.69E+03	1.48E+02
TE-129	2.55E+00	9.65E-01	1.95E+00	1.07E+01	0.	1.92E+00	6.21E-01
TE-131M	1.41E+02	6.87E+01	1.09E+02	6.95E+02	0.	6.81E+03	5.72E+01
TE-131	1.60E+00	6.68E-01	1.31E+00	7.00E+00	0.	2.39E-01	5.04E-01
TE-132	2.05E+03	1.33E+02	1.46E+02	1.28E+03	0.	6.25E+03	1.24E+02
I-130	3.98E+01	1.18E+02	1.50E+04	1.83E+02	0.	1.01E+02	4.63E+01
I-131	2.18E+02	3.13E+02	1.02E+05	5.36E+02	0.	8.24E+01	1.79E+02
I-132	1.07E+01	2.85E+01	3.76E+03	4.55E+01	0.	5.36E+00	1.01E+01
I-133	7.51E+01	1.30E+02	2.51E+04	2.27E+02	0.	1.15E+02	3.98E+01
I-134	5.57E+00	1.51E+01	1.96E+03	2.41E+01	0.	1.32E-02	5.41E+00
I-135	2.33E+01	6.14E+01	8.03E+03	9.77E+01	0.	6.88E+01	2.25E+01
CS-134	6.85E+03	1.63E+04	0.	5.29E+03	1.75E+03	2.85E+02	1.33E+04
CS-136	7.17E+02	2.83E+03	0.	1.58E+03	2.16E+02	3.22E+02	2.04E+03

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		FNVIRONMEN			LE L-2 FRSION FACTO	RS FOR LIQUIE		
		PATHW	AY - SALT WAT	TER FISH AND !	SHELLFISH	AGE GROUP	· ADULT	
			ORGAN [DOSE FACTOR	(MREM/HR P	ER uCi/ML)		
	NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
	CS-137	8.79E+03	1.20E+04	0.	4.09E+03	1.36E+03	2.31E+02	7.88E+03
	CS-138	6.08E+00	1.20E+01	0.	8.84E+00	8.73E-01	5.12E-05	5.96E+00
	BA-139	7.87E+00	5.61E-03	0.	5.24E-03	3.18E-03	1.39E+01	2.30E-01
	BA-140	1.65E+03	2.07E+00	0.	7.04E-01	1.18E+00	3.39E+03	1.09E+02
	BA-141	0.	2.89E-03	0.	2.68E-03	1.64E-03	1.80E-09	1.29E-01
	BA-142	1.73E+00	1.78E-03	0.	1.50E-03	1.01E-03	0.	1.09E-01
	LA-140	1.58E+00	7.95E-01	0.	0.	0.	5.83E+04	2.11E-01
	LA-142	8.07E-02	3.67E-02	Q.	0.	0.	2.68E+02	9.15E-03
	CE-141	3.43E+00	2.32E+00	0.	1.08E+00	0.	8.87E+03	2.63E-01
	CE-143	6.05E-01	4.47E+02	0.	1.97E-01	0.	1.67E+04	4.95E-02
	CE-144	1.79E+02	7.48E+01	0.	4.43E+01	0.	6.05E+04	9.60E+00
	PR-144	1.91E-02	7.88E-03	Q.	4.45E-03	0.	2.73E-09	9.65E-04
	W-187	9.17E+00	7.68E+00	0.	0.	0.	2.51E+03	2.69E+00
Ē	NP-239	3.56E-02	3.50E-03	0.	1.08E-02	0.	7.12E+02	1.92E-03

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	FNVIRONMEN			EL-3 RSION FÁCTO		DISCHARGES	
	PATHWA	- SALT WATE	R FISH AND SH	ELLFISH	AGE GROUP -	TEENAGER	<u>-</u>
		ORGAN [OSE FACTOR	(MREM/HR P	ER μCi/ML)		
					. ,		
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI _T LLI	WHOLE BODY
H3	0.	2.17E-01	2.17E-01	2.74E-01	2.17E-01	2.17E-01	2.17E-01
C-14	2.94E+03	2.94E+03	2.94E+03	2.22E+03	2.94E+03	2.94E+03	2.94E+03
NA24	4.63E-01	4.63E-01	4.63E-01	4.63E-01	4.63E-01	4.63E-01	4.63E-01
P32	1.27 [/] E+07	7.98E+05	0.	0.	0.	1.43E+06	4.93E+05
CR51	0.	0.	2.54E+00	9.38E-01	5.64E+00	1.07E+03	4.25E+00
MN54	0.	5.38E+03	0.	1.60E+03	0.	1.65E+04	1.03E+03
MN56	0.	1.36E+02	0.	1.72E+02	0.	4.32E+03	2.42E+01
FE55	8.78E+04	3.95E+05	0.	0.	4.57E+05	1.54E+05	1.04E+05
FE59	6.14E+04	1.46E+05	Q.	0.	4.05E+04	4.81E+05	5.55E+04
CO57	0.	1.08E+02	Ó.	0.	0.	2.74E+03	1.79E+02
CO58	0.	6.12E+02	0.	0.	0.	8.26E+03	1.39E+03
CO60	Q.	1.70E+03	0.	0.	0.	2.04E+04	3.88E+03
Ni-63	3.78E+04	2.63E+03	0.	0.	0.	5.47E+02	1.27E+03
NI65	1.54E+02	2.00E+01	Ó.	0.	0.	5.07E+02	9.11E+00
CU64	0.	1.64E+02	0.	4.12E+02	0.	1.39E+04	7.69E+01
ZN65	1.23E+05	3.90E+05	0.	2.61E+05	0.	2.46E+05	1.77E+05
ZN69	2.61E+02	5.02E+02	0.	3.24E+02	0.	7.50E+01	3.47E+01
BR82	0.	0.	0.	0.	0.	3.55E+00	3.10E+00
BR83	0.	0.	0.	0.	ρ.	7.95E-02	5.52Ė-02
BR84	0.	0.	0.	0.	0.	5.61E-07	7.16E-02
BR85	0.	0.	0.	0.	0.	0.	2.94E-03

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	ENVIRONMEN PATHWAY	ITAL PATHWA - SALT WATE ORGAN [TAB <u>Y-DOSE CONVI</u> R FISH AND SH DOSE FACTOR	LE L-3 ERSION FACTO IELLFISH (MREM/HR P	<mark>RS FOR LIQUIE AGE GROUP -</mark> ER μCi/ML)	DISCHARGES	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-I I I	
RB86	0.	4.76E+02	0.	0.	0.	9.37E+01	2.22E+02
RB88	0.	1.37E+00	0.	0.	0.	0.	7.23E-01
RB89	0.	9.04E-01	0.	0.	0.	0.	6.38E-01
SR89	5.67E+03	0.	0.	0.	0.	6.15E+02	1.63E+02
SR90	1.28E+05	Ó.	0.	0.	0.	2.71E+03	3.17E+04
SR91	7.18E+01	0.	0.	0.	0.	3.61E+02	3.16E+00
SR92	2.66E+01	0.	Ö.	0.	0.	5.25E+02	1.15E+00
Y90	1.58E+01	0.	0.	0.	1.80E+04	5.23E+04	4.25E-01
Y91M	4.36E-02	Ó.	0.	0.	0.	1.28E-01	1.69E-03
Y91	9.40E+01	0.	0.	0.	0.	3.61E+04	2.51E+00
Y92	4.06Ė-01	0.	d.	0.	0.	7.10E+03	1.18E-02
Y93	1.29E+00	0.	0.	0.	0.	4.08E+04	3.55E-02
ZR95	1.49E+01	4.96E+00	0.	6.16E+00	0.	1.07E+04	3.46E+00
ZR97	6.72E-01	1.36E-01	0.	2.05E-01	0.	4.20E+04	6.24E-02
NB95	3.97E+02	2.39E+02	0.	1.88E+02	0.	9.76E+05	1.35E+02
NB97	2.87E+00	7.24E-01	0.	8.45E-01	0.	2.67E+03	2.64E-01
MO99	0.	9.74E+01	0.	2.21E+02	0.	2.26E+02	1.85+01
TC-99M	9.87E-03	2.79E-02	0.	4.24E-01	1.37E-02	1.65E+01	3.56E-01
TC-101	1.02E-02	1.47E-02	0.	2.64E-01	7.47E-03	0.	1.44E-01

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TABLE L-3 <u>ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES</u> PATHWAY - SALT WATER FISH AND SHELLFISH AGE GROUP - TEENAGER ORGAN DOSE FACTOR (MREM/HR PER μCi/ML)											
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY				
RU-103	1.04E+02	0.	0.	3.11E+02	0.	8.13E+03	4.66E+01				
RU-105	6.77E+00	0.	0.	8.74E+01	0.	4.14E+03	2.67E+00				
RU-106	1.76E+03	0.	0.	2.34E+03	Q.	7.95E+04	2.21E+02				
AG110	1.19E+03	1.10E+03	0.	2.17E+03	0.	4.51E+05	6.56E+02				
SB-124	2.11E+02	3.99E+00	5.11E-01	0.	1.64E+02	5.98E+03	8.35E+01				
SB-125	1.68E+02	1.81E+00	1.49E-01	0.	1.75E+04	1.48E+03	3.37E+01				
TE 125M	2.36E+02	8.45E+01	6.66E+01	6.72E+02	0.	6.60E+02	3.13E+01				
TE 127M	4.18E+02	1.46E+02	1.07E+02	1.70E+03	0.	1.40E+03	5.09E+01				
TE-127	9.31E+00	3.28E+00	6.35E+00	2.76E+01	0.	7.52E+02	1.99E+00				
TE 129M	1.02E+03	3.79E+02	3.27E+02	2.96E+03	0.	3.58E+03	1.61E+02				
TE-129	1.94E+00	7.34E-01	1.49Ė+00	8.14E+00	0.	1.46E+00	4.72E-01				
TE 131M	1.07E+02	5,22E+01	8.26E+01	5.29E+02	0.	5.18E+03	4.35E+01				
TE-131	1.21E+00	5.08E-01	9.99E-01	5.33E+00	0.	1.82E-01	3.83E-01				
TE-132	2.19E+02	1.37E+02	1.46E+02	9.74E+02	0.	4.93E+03	1.30E+02				
I130	3.03E+01	8.95E+01	1.14E+04	1.39E+02	0.	7.67E+01	3.52E+01				
I131	2.23E+02	3.14E+02	9.07E+04	4.08E+02	0.	5.95E+01	1.87E+02				
I132	8.11E+00	2.17E+01	2.86E+03	3.46E+01	0.	4.08E+00	7.71E+00				
I133	8.11E+01	1.37E+02	2.50E+04	1.73E+02	0.	9.99E+01	4.24E+01				
I134	4.24E+00	1.15E+01	1.49E+03	1.83E+01	0.	1.00E-02	4.12E+00				

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				LE L-3 Ερείον γαρτοί					
	PATHWAY	- SALT WATE	R FISH AND SH	FLEISH	AGE GROUP	TEENAGER			
		ORGAN [DOSE FACTOR	(MREM/HR PI	ER uCi/ML)				
				C	——				
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY		
I135	1.77E+01	4.68E+01	6.11Ė+03	7.43E+01	0.	5.23E+01	1.71E+01		
CS-134	6.75E+03	1.63E+04	0.	4.03E+03	1.97E+03	1,88E+02	7.60E+03		
CS-136	5.46E+02	2.16E+03	0.	1.20E+03	1.65E+02	2.45E+02	1.55E+03		
CS-137	8.98E+03	1.21E+04	0.	3.11E+03	1.60E+03	1.61E+02	4.24E+03		
CS-138	4.63E+00	9.15E+00	Ó.	6.73E+00	6.65E-01	3.90E-05	4.54E+00		
BA-139	5.99E+00	4.27E-03	0.	3.99E-03	2.42E-03	1.06E+01	1.75E-01		
BA-140	1.75E+03	2.15E+00	0.	5.35E-01	1.44E+00	2.55E+02	1.12E+02		
BA-141	0.	2.20E-03	0.	2.04E-03	1.25E-03	1.37E-09	9.80E-02		
BA-142	1.31E+00	1.35E-03	0.	1.14E-03	7.64E-04	0.	8.26E-02		
LA-140	1.67E+00	8.25E-01	0.	0.	0.	4.55E+04	2.18E-01		
LA-142	6.14E-02	2.79E-02	0.	0.	0.	2.04E+02	6.95E-03		
CE-141	3.51E+00	2.36E+00	0.	8.19E-01	0.	6.38E+03	2.70E-01		
CE-143	4.60E-01	3.40E+02	0.	1.50E-01	0.	1.27E+04	3.76E-02		
CE-144	2.01E+02	8.25E+01	Ο.	3.37E+01	0.	4.74E+04	1.07E+01		
PR-144	1.45E-02	5.99E-03	0.	3.39E-03	0.	2.08E-09	7.34E-04		
W187	6.98E+00	5.85E+00	0.	0.	0.	1.91E+03	2.05E+00		
NP-239	2.71E-02	2.67E-03	0.	8.25E-03	0.	5.43E+02	1.46E-03		

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C-200		I	ST. LU	ICIE PLANT			
			ТАР			1	
	ENVIRONMEN				RS FOR LIQUID	DISCHARGES	
	PATHW	- CHILD	•				
		ORGAN	OSE FACTOR	(MREM/HR P	ER μCi/ML)		
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
H3	0.	1.81E-01	1.81E-01	1.19E-01	1.81E-01	1.81E-01	1.81E-01
C-14	3.82E+03	3.82E+03	3.82E+03	9.61Ė+02	3.82E+03	3.82E+03	3.82E+03
NA24	2.03E-01	2.03E _⊏ 01	2.03E-01	2.03E-01	2.03E-01	2.03E-01	2.03E-01
P32	5.53E+06	3.47E+05	0.	0.	· 0.	6.22E+05	2.14E+05
CR51	0.	0.	1.12E+00	4.13E-01	2.48E+00	4.70E+02	1.87E+00
MN54	0.	2.34E+03	Q.	6.95E+02	0.	7.15E+03	4.46E+02
MN56	0.	5.88E+01	0.	7.46E+01	0.	1.88E+03	1.05E+01
FE55	3.87E+04	1.74E+05	0.	0.	2.02E+05	6.81E+04	4.58E+04
FE59	2.71E+04	6.43E+04	0.	0.	1.79E+04	2.12E+05	2.45E+04
CO57	0.	4.78E+01	0.	0.	0.	1.21E+03	7.94E+01
CO58	0.	5.05E+02	b.	0.	0.	3.00E+03	1.52E+03
CO60	0.	1.41E+03	0.	0.	0.	7.80E+03	4.23E+03
Ni-63	1.66E+04	1.15E+03	0.	0.	0.	2.39E+02	5.55E+02
NI65	6.73E+01	8.74E+00	0.	0.	0.	2.22E+02	3.98E+00
CU64	0.	7.15E+01	d.	1.80E+02	0.	6.09E+03	3.36E+01
ZN65	5.47E+04	1.74E+05	0.	1.16E+05	0.	1.09E+05	7.86E+04
ZN69	1.16E+02	2.23E+02	0.	1.44E+02	0.	3.34E+01	1.55E+01
BR82	Ó.	0.	0.	0.	0.	1.59E+00	1.39E+00
BR83	0.	0.	0.	0.	0.	3.55E-02	2.47E-02
BR84	0.	0.	0.	0.	0.	2.51E-07	3.20E-02
BR85	0.	0.	0.	0.	0.	0.	1.31E-03

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C-200			ST. LL	JCIE PLANT			
· · · · · · · · · · · · · · · · · · ·	<u>ENVIRONMEN</u> PATHW	ITAL PATHWA AY - SALT WA ORGAN E	TAB Y-DOSE CONVE TER FISH AND DOSE FACTOR	LE L-4 ERSION FACTO SHELLFISH (MREM/HR P	<mark>RS FOR LIQUIE</mark> Δ GE GROUF ER μCi/ML)	DISCHARGES - CHILD	
NUCLIDE	BONE		THYROID	KIDNEY	LUNG	GLU	
RB86	0	2.08F+02	0	0	0	4.09E+01	9.68E+01
RB88	0.	5.96E-01	0.	0	0	0	3.16E-01
RB89	0.	3.95E-01	0.	0.	0.	0.	2.78E-01
SR89	7.53E+03	0.	0.	0.	0.	2.81E+02	2.16E+02
SR90	9.39E+04	0,	0.	0.	0.	1.25E+03	2.38E+04
SR91	3.18E+01	0.	0.	0.	0.	1.60E+02	1.40E+00
SR92	1.18E+01	0.	0.	0.	0.	2.33E+02	5.08E-01
Y90	9.00E+00	0.	0.	0.	0.	2.57E+04	2.42E-01
Y91M	1.95E-02	0.	0.	0.	0.	5.71E-02	7.55E-04
Y91	1.25E+02	0.	0.	0.	0.	1.66E+04	3.34Ė+00
Y92	1.81E-01	0.	0.	0.	0.	3.16E+03	5.28E-03
Y93	5.73E-01	0.	0.	0.	0.	1.82E+04	1.58E-02
ZR95	1.80E+01	4.19E+00	0.	2.67E+00	0.	4.33E+03	3.81E+00
ZR97	2.91E-01	5.87E-02	0.	8.86E-02	0.	1.82E+04	2.70E-02
NB95	4.61E+02	1.97E+02	0.	8.11E+01	0.	3.41E+05	1.45E+02
NB97	1.24E+00	3.12E-01	Q.	3.64Ė-01	0.	1.15E+03	1.14E-01
MO99	0.	4.23E+01	0.	9.59E+01	0.	9.81E+01	8.05E+00
TC-99M	4.34E-03	1.23E-02	0.	1.86E-01	6.01E-03	7.26E+00	1.57E-01
TC-101	4.47E-03	6.45E-03	0.	1.16E-01	3.29E-03	0.	6.33E-02

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C-200			ST. LU	JCIE PLANT						
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			סאו ע-חטפב כטווענ							
	DATHWAY - SALT WATER FISH AND SHELL FISH AGE GROUP - CHILD									
		ORGAN [DOSE FACTOR	(MREM/HR P						
		- · , - · ·		(····· -						
NUCLIDE	BÓNE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY			
RU-103	1.33E+02	0.	0.	1.39E+02	Ó.	3.50E+03	5.38E+01			
RU-105	3.03E+00	0.	0.	3.91E+01	0.	1.85E+03	1.19E+00			
RU-106	2.34E+03	0.	0.	1.05E+03	0.	3.63E+04	2.91E+02			
AG110	5.18E+02	4.80E+02	0.	9.43E+02	0.	1.96E+05	2.85E+02			
SB-124	9.13E+01	1.72E+00	2.21E-01	0.	7.08E+01	2.58E+03	3.61E+01			
SB-125	7.24E+01	7.80E-01	6.43E-02	0.	7.57E+03	6.40E+02	1.46E+01			
TE 125M	3.11E+02	8.43E+01	8.73E+01	2.97E+02	0.	3.00E+02	4.15E+01			
TE 127M	1.85E+02	6.47E+01	4.72E+01	7.50E+02	0.	6.19E+02	2.25E+01			
TE-127	1.23E+01	3.27E+00	8.46E+00	1.22E+01	0.	5.24E+02	2.63E+00			
TE129M	1.35E+03	3.77E+02	4.31E+02	1.31E+03	0.	1.63E+03	2.09E+02			
TE-129	8.59E-01	3.25E-01	6.58E-01	3.60E+00	Ó.	6.47E-01	2.09E-01			
TE131M	4.75E+01	2.31E+01	3.66E+01	2.34E+02	0.	2.29E+03	1.93E+01			
TE-131	5.38E-01	2.25E-01	4.42E-01	2.36E+00	0.	8.05Ę-02	1.70E-01			
TE-132	2.78E+02	1.23E+02	1.81E+02	4.31E+02	0.	2.15E+03	1.48E+02			
I130	1.33E+01	3.94E+01	5.01E+03	6.12E+01	0.	3.38E+01	1.55E+01			
I131	2.87E+02	2.94E+02	9.55E+04	1.79E+02	0.	2.51E+01	2.22E+02			
132	3.57E+00	9.55E+00	1.26Ė+03	1.52E+01	0.	1.79E+00	3.39E+00			
I133	1.05E+02	1.30E+02	3.13E+04	7.61E+01	0.	5.26E+01	5.10E+01			
I134	1.86E+00	5.06E+00	6.58E+02	8.07E+00	0.	4.41E-03	1.81E+00			

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C-200		ST. LUCIE PLANT							
	ENVIRONMEN PATHW	ITAL PATHWA AY - SALT WA ORGAN [TAB Y-DOSE CONVI TER FISH AND DOSE FACTOR	LE L-4 <u>ERSION FACTO</u> SHELLFISH (MREM/HR PI	<mark>RS FOR LIQUIE</mark> AGE GROUF ER μCi/ML)	DISCHARGES - CHILD			
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY		
I135	7.79E+00	2.06E+01	2.69E+03	3.27E+01	0.	2.30E+01	7.54E+00		
CS-134	8.14E+03	1.37E+04	0.	1.75E+03	1.52E+03	7.42E+01	2.92E+03		
CS-136	2.37E+02	9.34E+02	0.	5.20E+02	7.13E+01	1.06E+02	6.73Ė+02		
CS-137	1.13E+04	1.10E+04	0.	1.35E+03	1.29E+03	6.69E+01	1,64E+03		
CS-138	2.01E+00	3.96Ė+00	0.	2.92E+00	2.88E-01	1.69E-05	1.97E+00		
BA-139	2.65E+00	1.89E-03	0.	1.77E-03	1.07E-03	4.69E+00	7.75E-02		
BA-140	2.25E+03	1.98E+00	0.	2.37E-01	1.18E+00	1.15E+02	1.32E+02		
BA-141	0.	9.71E-04	0.	9.03E-04	5.51E-04	6,06E-10	4.34E-02		
BA-142	5.81E-01	5.98E-04	0.	5.05E-04	3.38E-04	0.	3.66E-02		
LA-140	2.16E+00	7.52E-01	0.	0.	0.	2.14E+04	2.54E-01		
LA-142	2.74E-02	1.24E-02	0.	0.	0.	9.09E+01	3.10E-03		
CE-141	4.67E+00	2.34E+00	0.	3.66E-01	0.	2.93E+03	3.48E-01		
CE-143	2.05E-01	1.52E+02	0.	6.69E-02	0.	5.67E+03	1.68E-02		
CE-144	2.66E+02	8.33E+01	0.	1.50E+01	0.	2.16E+04	1.42E+01		
PR-144	6.46E-03	2.67E-03	0.	1.51E-03	0.	9.26Ė-10	3.27E-04		
W187	3.03E+00	2.54E+00	0.	0.	0.	8.31E+02	8.90E-01		
NP-239	1.18E-02	1.16E-03	0.	3.58E-03	0.	2.36E+02	6.34E-04		

ROCEDURE NO .:	URE NO.:					
C-200		ST. LL	JCIE PLANT-			
EFFLUE		TAB RATION LIMI	LE G-1 TS IN AIR IN UN	IRESTRICTE	D AREAS	
If a nucl Effluent listed for	ide is not listed b Concentrations i r the nuclide.	<u>NC</u> below, refer to Column 1 and	DTE 10 CFR Part 20 d use the most co	, Appendix B, onservative E(Table 2 CL	
Nuclide-	ECL (µCi/ml)	Nuclide	ECL (uCi/ml)	Nuclide	ECL (uCi/m	
Аг-41	1 E-8	Co-57	-9 E-10	Sb-124	3 E-10	
Kr-83m	5 E-5	Co-58	1 E-9	Sb-125	7 E-10	
Kr-85m	1_E-7	Fe-59	5 E-10	Te=125m	1 E-9	
Kr=85	-7- E-7	Co-60-	5 E-11	Te-127m	4 E-10	
Kr-87	2 E-8	Zn-65	-4 E-10	Te-129m	3 E-10	
Kr-88	9 E-9	Rb-86	1 E-9	<u>l</u> -130	3 E-9	
Kr-89	None	Rb-88	9 E-8	I-1 3 1	2 E-10	
Kr-90	None	Sr-89	2 E-10	I-132	2 E-8	
Xe-131m	2 E-6	Sr-90	6 E-12	I-133	1 E-9	
Xe-133m	6 E-7	Y-91	2 E-10	I-134	6 E-8	
Xe-133	5 E-7	Zr-95	4 E-10	I-135	6 E-9	
Xe-135m	4 E-8	Nb-95	2 E-9	Cs-134	2 E-10	
Xe-135	7 E-8	Ru-103	9 E-10	_Cs-136	9 E-10	
Xe-137	None	Ru-106	2 E-11	Cs-137	2 E-10	
Xe-138	2 E-8	Ag-110	1 E-10	Ba- <u>1</u> 40	2-E-9	
H-3	1 E-7	Sīn-113	8 E-10	La-140	2 E-9	
P-32	1 E-9_	In-113m-	2 E-7	Ce-141	8 E-10	
Cr-51	3 E-8	Sn-123	2 E-10	Ce-144	2 E-11	
Mn-54 1 E-9 Sn-126 8-E-11						

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C-200) ST. LUCIE PLANT									
DOSE FACTORS FOR NOBLE GASES*										
										
			SKIN	GAMMA 'AIR	BETA AIR					
RADIONUCI	LIDE	DOSEFACTOR	DOSEFACTOR	DOSE FACTOR	DOSEFACTOR					
		$(mrom/vr por vCi/m^3)$	L_i	$ V _i$ (mrad/kr par uCi/m ³)	N (mrod/ur porCi/m ³)					
Kr 83m	(1111			$\frac{102E+01}{102E+01}$						
1/1-03111 1/1-05m	<u> </u>		4.465.02	1.952+01						
<u>KI-00III</u>			1.46E+03	1.235+03	1.97 E+03					
Kr-85	·	1.61E+01	1.34E+03	1.72E+01	1.95E+03					
Kr-8/		5.92E+03	9.73E+03	6.17E+03	1.03E+04					
Kr-88		1.47E+04	2.37E+03	1.52E+04	2.93E+03					
Kr-89		1.66E+04	1.01E+04	1.73E+04	1.06E+04					
Kr-90		1.56E+04	7.29E+03	1.63E+04	7.83E+03					
Xe-131n	n	9.15E+01	4.76E+02	1.56E+02	1.11E+03					
Xe-133n	n	2.51E+02	9.94E+02	3.27E+02	1.48E+03					
Xe-133		2.94E+02	3.06E+02	3.53E+02	1.05E+03					
Xe-135n	n	3.12E+03	7.11E+02	3.36E+03	7.39E+02					
Xe-135		1.81E+03	1.86E+03	1.92E+03	2.46E+03					
Xe-137		1.42E+03	1.22E+04	1.51E+03	1.27E+04					
Xe-138	1	8.83E+03	4.13E+03	9.21E+03	4.75E+03					
Ar-41		8.84E+03	2.69E+03	9.30E+03	3.28E+03					

* The listed dose factors are for radionuclides that may be detected in gaseous effluents.

** 7.56E-02 = 7.56 X 10⁻²

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EN	IVIRONMENTAL PATHWAY	TAB	LE G-3 ION FACTORS P (I)	FOR GASEOUS DISCHARG	ES
	PATHWAY - GRO	UND PLANE DEPO	OSITION AGE	GROUP - INFANT	
	ORGAN DOS	E FACTOR (SQ.	METER - MREM/YR	PER μCi/Sec)	•
				_	
		NUCLIDE	WHOLE BODY		
		H-3	0.		
		CR-51	6.68E+06]	
		MN-54	1.10E+09		
		FE-59	3.92E+08		
		CO-57	1.64E+08	-	
		CO-58	5.27E+08	-	
		CO-60	4.40E+09		
		ZN-65	6.87E+08	-	
		RB-86	1.29E+07		
		SR-89	3.07E+04	-	
		SR-90	5.94E+05	-	
		Y-91	1.53E+06	1	
		ZR-95	6.94E+08	-	
		NB-95	1.95E+08	1	
		RU-103	1.57E+08	1	
		RU-106	2.99E+08	1	
		AG-110	3.18E+09	1 .	
			<u> </u>	-	

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<u>50</u>	OFFSITE D	OSE CALC	ULATION MANUAL	(ODCM)	170 of 221					
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C-200		ST. LUCIE PLANT								
Ī	NVIRONMENTAL PATHWAY-DOSE		LE G-3 ION FACTORS P (I)		IARGES					
	PATHWAY - GROUND PL		USITION AGE	GROUP - INFANI						
	ORGAN DOSE FACT	JR (SQ.	METER - MREMIYR	PER µCI/Sec)						
	NL	ICLIDE	WHOLE BODY]						
	S	V-126	4.80E+09	-						
	S	3-124	8.42E+08							
	SI	3-125	7.56E+08							
	TE	E-125M	2.19E+06							
	TI	E-127M	1.15E+06							
	TE	E-129M	5.49E+07	-						
		30	7.90E+06							
		31	2.46E+07							
		32	1.78E+06							
		33	3.54E+06							
		34	6.43E+05]						
		35	3.66E+06							
	Ċ	S-134	2.82E+09							
	C	S-136	2.13E+08							
	C	S-137	1.15E+09							
	B	\-140	2.39E+08]						
	C	E-141	1.95Ę+07							
	С	E-144	9.52É+07							

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C-200		ST. LUCIE PLANȚ								
	•	TAD		· · · · · · · · · · · · · · · · · · ·						
E	NVIRONMENTAL DATHWAY									
	PATHWAY - GROUND PLANE	DEPOSITION	AGE GROUP - CH	HID - TEEN-ADUI T & INEAN	<u>.5</u> Т					
	ORGAN DOSE	FACTOR (SQ.	METER - MREM/YR	PER uCi/Sec)						
		(ea.	····							
				_						
	_	NUCLIDE	WHOLE BODY							
	_	H-3	0.							
		C-14	0							
		CR-51	4.68E+06							
	_	MN-54	1.38E+09	_						
		FE-59	2.75E+08							
		CQ-57	1.89E+08							
	_	CO-58	3.80E+08							
		CO-60	2.15E+10							
		ZN-65	7.43E+08							
		RB-86	9.01E+06							
		SR-89	2.17E+04							
		SR-90	5.35E+06							
		Y-91	1.08E+06							
		ZR-95	5.01E+08							
		NB-95	1.36E+08							
		RU-103	1.10E+08							
	-	RU-106	4.19E+08							
		ÅG-110	3.58E+09							

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C-200		ST. I UCIE PLANT							
		TABL	E G-4						
E	NVIRONMENTAL PATHWAY	-DOSE CONVERSI	<u>ON FACTORS R (I)</u>	FOR GASEOUS DISCHARGE	S				
F	PATHWAY - GROUND PLANE	E DEPOSITION	AGE GROUP - CH	IILD - TEEN-ADULT & INFAN	Т				
	ORGAN DOS	SE FACTOR (SQ.)	METER - MREM/YR	PER μCi/Sec)					
		NUCLIDE		1					
		SN-126	5 16F+10	-					
		SB-124	5.98E+08	1					
		SB-125	2.30E+09	1					
		TE-125M	1.55E+06						
		TE-127M	8.79E+05	1					
		TE-129M	3.85E+07						
		I-130	5,53E+06						
		I-131	1.72E+07]					
		I-132	1.25E+06						
		I-133	2.48E+06	_					
		I-134	4.50E+05						
		l-135	2.56E+06						
		CS-134	6.99E+09						
		CS-136	1.49E+08	_					
		CS-137	1.03E+10	4					
		BA-140	1.68E+08	4					
		CE-141	1.37E+07	4					
		CE-144	1.13E+08	ļ					

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C-200		ST. LUCIE PLANT								
	TABLE G-5									
<u>ENV</u>	<u>/IRONMENTAL F</u>	PATHWAY-DOS	E CONVERSIC	N FACTORS R(I)/P(I) FOR GAS	EOUS DISCHA	<u>RGES</u>			
		ORGAN DU	SE FACTOR		µCi/Cu Meter)					
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY			
H-3	0.	4.30E+02	4.30E+02	1.88E+02	4.30E+02	4.30E+02	4.30E+02			
C-14	5.04E+03	4.28E+03	4.28E+03	5.98E+02	4.28E+03	4.28E+03	4.28E+03			
P-32	2.31E+05	1.35E+04	0.	0.	0.	1.51E+04	8.78E+03			
CR-51	0.	0.	1.40E+01	3.99E+00	2.52E+03	5.81E+02	1.75E+01			
MN-54	0.	6.93E+03	0.	1.72E+03	2.45E+05	1.35E+04	1.10E+03			
FE-59	2.06E+03	4.86E+06	0.	0.	1.78E+05	3.29E+04	1.85E+03			
CO-57	0.	1.21E+02	0.	0.	6.47E+04	5.50E+03	1.18E+02			
CO-58	0.	1.18E+02	0.	0.	8.79E+05	1.21E+04	1.68E+02			
CO-60	0.	8.40E+02	0.	0.	5.57E+06	3.28E+04	1.17E+03			
ZN-65	5.67E+03	1.81E+04	0.	1.21E+04	1.53E+05	9.35E+03	8.15E+03			
RB-86	0.	2.37E+04	0.	0.	0.	2.91E+03	1.03E+04			
SR-89	4.31E+04	0.	0.	0.	2.31E+06	6.80E+04	1.24E+03			
SR-90	1.32E+07	0.	0.	0.	1.53E+07	1.39E+05	8.06E+05			
Y-91	5.98E+04	0.	0.	0.	2.63E+06	7.17E+04	1.60E+03			
ZR-95	1.08E+04	2.73E+03	0.	9.48E+03	1.81E+06	1.41E+04	1.95E+03			
NB-95	1.28E+03	5.75E+02	0.	1.35E+03	4.77E+05	1.21E+04	3.37E+02			
RU-103	1.69E+02	0.	0.	1.02E+03	5.66E+05	1.58E+04	5.85E+01			
RU-106	9.31E+03	0.	0.	2.34E+04	1.50E+07	1.76E+05	1.14E+03			
AG-110	1.89E+03	1.75E+03	Q	3.44E+03	8.12E+05	5.29E+04	1.04E+03			

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C-200			ST. LU	ICIE PLANT	I				
TABLE G-5 ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I)/P(I) FOR GASEOUS DISCHARGES									
		PATHWAY	- INHALATION	AGE GRO	UP - INFANT	1			
		ORGAN DOS	SE FACTOR (MREM/YR PER	μCi/Cu Meter)				
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY		
SN-123	3.11E+04	6.45E+02	6.45E+02	0.	3.61E+06	5,99E+04	1.02E+03		
SN-126	2.21E+05	5.85E+03	1.72E+03	0.	1.64E+06	2.23E+04	8.40E+03		
SB-124	5.46E+03	1.03E+02	1.32🗄+01	0.	4.34E+05	7,11E+04	2.17E+03		
SB-125	1.16E+04	1.25E+02	1.03E+01	0.	3.85E+05	1.76E+04	2.32E+03		
TE-125M	4.54E+02	1.95E+02	1.53E+02	2.17E+03	4.96E+05	1.36E+04	6.16E+01		
TE-127M	2.21E+03	9.83E+02	5.75E+02	8.01E+03	1.68E+05	2.62E+04	2.74E+02		
TE-129M	1.32E+03	5.80E+02	5.08E+02	6.40E+03	1.83E+06	7.32E+04	2.06E+02		
I-130	8.02E+02	2.35E+03	3.05E+05	3.65E+03	0.	1.35E+03	9.25E+02		
I-131	3.63E+04	4.27E+04	1.41E+07	1.07E+04	0.	1.07E+03	2.51E+04		
I-132	2.03E+02	5.70E+02	7.67E+04	9.09E+02	0.	7.11E+01	2.03E+02		
I-133	1.34E+04	1.93E+04	4.66E+06	4.55E+03	0.	2.28E+03	5.87E+03		
I-134	1.13E+02	3.02E+02	4.02E+04	4.82E+02	0.	1.76E-01	1.08E+02		
I-135	4.70E+02	1.22E+03	1.64E+05	1.95E+03	Ó.	9.18E+02	4.51E+02		
CS-134	4.80E+05	8.25E+05	0.	5.04E+04	1.01E+05	1.37E+03	7.32E+04		
CS-136	6.85E+03	2.56E+04	0.	1.50E+04	2.10E+03	2.04E+03	1,95E+04		
CS-137	6.86E+05	7.31E+05	0.	3.89E+04	9.45E+04	1.32E+03	4.41E+04		
BA-140	5.70E+03	4.27E+00	0.	2.93E+00	1.64E+06	3.88E+03	2.95E+02		
CE-141	2.52E+03	1,55E+03	0.	1.10E+03	5.24E+05	2.06E+04	1.81E+02		
CE-144	4.68E+05	1.82E+05	0.	1.48E+05	1.27E+07	1.61E+05	2.49E+04		

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C-200		, I	ST. LU	CIE PLANT	·		
				ECG		t	
FN				LE G-6 N FACTORS R/I		FOUS DISCHA	RGES
	PATHWAY	- COWS MILK	(CONTAMINATI	ED FORAGE)	AGE GROL	IP - INFANT	
	۲ ۲۰۱۰ ۳۳۲۲	ORGAN DOSE F	ACTOR (SO	METER - MREN	//YR PFR ui/Se	c)	
	·					0)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
H-3	0.	2.37E+03	2.37E+03	1.04E+03	2.37E+03	2.37E+03	2.37E+03
C-14	6.55E+05	6.55E+05	6.55E+05	7.55E+04	6.55E+05	6.55E+05	6.55E+05
P-32	1.82E+10	1.14E+09	0.	0.	0.	2.05E+09	7.05E+08
CR-51	0.	0.	1.82E+04	6.72E+03	4.04E+04	7,66E+06	3.05E+04
MN-54	0.	8.96E+06	0.	2.67E+06	0.	2.74E+07	1.71E+06
FE-59	3.17E+07	7.52E+07	0.	0.	2.09E+07	2.48E+08	2.86E+07
CO-57	0.	1.36E+06	0.	0.	0.	3.46E+07	2.27E+06
CO-58	0.	2.55E+07	0.	0.	0.	6.60E+07	6.24E+07
CO-60	0.	8.73E+07	0.	0.	0.	2.16E+08	2.09E+08
ZN-65	1.46E+09	4.65E+09	0.	3.11E+09	0.	2.93E+09	2.10E+09
RB-86	0.	2.77E+09	0.	0.	0.	5.45E+08	1.29E+09
SR-89	1.47E+10	0.	0.	0.	0.	2.75E+08	4.22Ė+08
SR-90	1.65E+11	0.	0.	0.	0.	1.61E+09	4.21E+10
Y-91	8.12E+04	0.	0.	0.	0.	5.37E+06	2.16E+03
ZR-95	2.12E+05	9.41E+04	0.	1.86E+04	0.	7.47E+07	5.56E+04
NB-95	5.49E+05	2.47E+05	0.	4.84E+04	0.	1.98E+08	1,45E+05
RU-103	8.30E+03	0.	0.	4.16E+03	0.	1,04E+05	2.86E+03
RU-106	2.01E+05	0.	0.	4.20E+04	0.	1.56E+06	2.46E+04
AG-110	6.21E+07	5.75E+07	0.	1.13E+08	0.	2,35E+10	3.42E+07

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Based on 1 μ Ci/sec release rate of each isotope in and a Value of 1. for X/Q, depleted X/Q and Relative Deposition

Note: The units for C-1¹4 and H-3 are (MREM/YR Per μ Ci/Cu. Meter)

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C-200		ST. LUCIE PLANT							
TABLE G-6 ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I)/P(I) FOR GASEOUS DISCHARGES									
·	PATHWAY	- COWS MILK	(CONTAMINAT	ED FORAGE)	AGE GROL	JP - INFANT	<u>,</u>		
	C	RGAN DOSE F	ÀCTOR (SQ.	METER - MREM	I/YR PER μCi/Se	ec)			
	_		1		·	,			
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY		
SN-126	1.75E+09	3.48E+07	1.01E+07	0.	4.97E+06	1.16E+09	5.25E+07		
SB-124	2.75E+07	5.19E+05	6.64E+04	0.	2.13E+07	7.78E+08	1.09E+07		
SB-125	3.59E+07	3.27E+06	2.93E+06	3.96E+06	2.83E+09	2.43E+08	6.62E+06		
TE-125M	1.57E+08	5.30E+07	5.18E+07	7.05E+07	0.	7.57E+07	2.10E+07		
TE-127M	5.54E+07	1.93E+07	1.79E+07	2.00E+08	0.	3.24E+08	7.38E+06		
TE-129M	5.87E+08	2.02E+08	2.21Ė+08	2.70E+08	0.	3.54E+08	8.95E+07		
I-130	4.54E+05	1.35E+06	1.71E+08	2.09E+06	0.	1.15E+06	5.29E+05		
I-131	2.59E+09	3.09E+09	9.94E+11	7.24E+08	0.	1.16E+08	1.81E+09		
I-132	1.78E-01	4.76E-01	6.26E+01	7.58E-01	0.	8.93E-02	1.69E-01		
I-133	3.75E+07	5.48E+07	1.30E+10	1.29E+07	0.	9.74E+06	1.66E+07		
I-134	0.	0.	1.06E-09	0.	0.	0.	0.		
I-135	1.49E+04	3.94E+04	5.15E+06	6.26E+04	8.07E-02	4.41E+04	1.44E+04		
CS-134	4.43E+10	7.97Ė+10	0.	4.65E+09	9.12E+09	1.90E+08	6.75E+09		
CS-136	2.78E+08	1.10E+09	0.	6.11E+08	8.37E+07	1.25E+08	7.90E+08		
CS-137	6.44E+10	7.21E+10	0.	3.66E+09	8.69E+09	1.86E+08	4.14E+09		
BA-140	2.45E+08	2.47E+05	0.	1.22E+04	1.51E+05	8.13E+06	1.27E+07		
CE-141	2.65E+05	1.62E+05	0.	9.72E+03	0.	7.87E+07	1.90E+04		
CE-144	2.10E+07	8.29E+06	0.	5.67E+05	0.	8.66E+08	1.13E+06		

Based on 1 μ Ci/sec release rate of each isotope in and a Value of 1. for X/Q, depleted X/Q and Relative Deposition

Note: The units for C-14 and H-3 are (MREM/YR Per μ Ci/Cu. Meter)

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C-200		1	ST. LU	ICIE PLANT			
			·	1			
			TABI	LE G-7			
<u>ENV</u>	IRONMENTAL F	PATHWAY-DOS	<u>E CONVERSIO</u>	N FACTORS R(<u>)/P(I) FOR GAS</u>	EOUS DISCHA	<u>RGES</u>
	PATHWAY	- GOATS MILK	(CONTAMINAT	ED FORAGE)		JP - INFANT	
	C	RGAN DOSE F	ACTOR (SQ.	METER - MREM	I/YR PER µCI/Se	∋C)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
H-3	0.	4.84E+03	4.84E+03	2.11E+03	4.84E+03	4.84E+03	4.84E+03
C-14	6.55E+05	6.55E+05	6.55E+05	7.75E+04	6.55E+05	6.55E+05	6.55E+05
P-32	2.19E+10	1.37E+09	0.	0.	0.	2.46E+09	8.46E+08
CR-51	0.	0.	2.19E+03	8.07E+02	4.85E+03	9.19E+05	3.66E+03
MN-54	0.	1.08E+06	0.	3.20É+05	0.	3.29E+06	2.05E+05
FE-59	4.12E+05	9.78E+05	0.	0.	2.72E+05	3.23E+06	3.72E+05
CO-57	0.	1.64E+05	0.	0.	0.	4.15E+06	2.72E+05
CO-58	0.	3.06E+06	d.	0.	0.	7.92E+06	7.49E+06
CO-60	0.	1.05E+07	0.	0.	0.	2.59E+07	2.51E+07
ZN-65	1.76E+08	5.57E+08	0.	3.73E+08	0.	3.51E+08	2.52E+08
RB-86	0.	3.32E+08	0.	0.	0.	6.54E+07	1.55E+08
SR-89	3.09E+10	0.	0.	0.	0.	5.77E+08	8.87E+08
SR-90	3.46E+11	0.	0.	0.	0.	3.35E+09	8.83E+10
Y-91	9.74Ė+03	0.	0.	0.	0.	6.45E+05	2.60E+02
ZR-95	2.54E+04	1.13E+0/4	Q.	2.23E+03	0.	8.95E+06	6.67E+03
NB-95	6.59E+04	2.97E+04	0.	5.81E+03	0.	2.37E+07	1.75E+04
RU-103	9.96E+02	Q.	0.	4.99E+02	0.	1.24E+04	3.43E+02
RU-106	2.41E+04	0.	0.	5.04E+03	0.	1.87E+05	2.96E+03
AG-110	7.45E+06	6.90E+06	0.	1.36E+07	0.	2.81E+09	4.10E+06

Note: The units for C-14 and H-3 are (MREM/YR Per $\mu\text{Ci/Cu}.$ Meter)

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C-200		ST. LUCIE PLANT							
TABLE G-7 ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I)/P(I) FOR GASEOUS DISCHARGES									
ORGAN DOSE FACTOR (SQ. METER - MREM/YR PER µCi/Sec)									
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY		
SN-126	2.10E+08	4.17E+06	1.22E+06	0.	5.97E+05	1.40E+08	6.30E+06		
SB-124	3.30E+06	6.22E+04	7.97E+03	0.	2.56E+06	9.33E+07	1.30E+06		
SB-125	4.31E+06	3.92E+05	3.52E+05	4.76E+05	3.40E+08	2.92E+07	7.94E+05		
TE-125M	1.89E+07	6.36E+06	6.21E+06	8.46E+06	0.	9.09E+06	2.52E+06		
TE-127M	6.64E+06	2.31E+06	2.15E+06	2.40E+07	0.	3.88E+07	8.85E+05		
TE-129M	7.05E+07	2.42E+07	2.66E+07	3.23E+07	0.	4.25E+07	1.07E+07		
I-130	5.45E+05	1.61E+06	2.05E+08	2.51E+06	0.	1.38E+06	6.35E+05		
I-131	3.11E+09	3.70E+09	1.19 戸+12	9.28E+08	0.	1.39E+08	2.17E+09		
I-132	2.13E-01	5.71E-01	7.51E+01	9.10E-01	0.	1.07E-01	2.03E-01		
I-133	4.50E+07	6.57E+07	1.55E+10	1.55E+07	0.	1.17E+07	1.99E+07		
I-134	0.	0.	1.27E-09	0.	0.	0.	0.		
I-135	1.79E+04	4.72E+04	6.18E+06	7.51E+04	2.42E-01	5.29E+04	1.73E+04		
CS-134	1.33E+11	2.39E+11	0.	1.39E+10	2.74E+10	5.69E+08	2.02E+10		
CS-136	8.34E+08	3.29E+09	0.	1.83E+09	2.51E+08	3.74E+08	2.37E+09		
CS-137	1.93E+11	2.16E+11	0.	1.10E+10	2.61E+10	5.59E+08	1.24E+10		
BA-140	2.95E+07	2.96E+04	0.	1.47E+03	1.81E+04	9.76E+05	1.52E+06		
CE-141	3.17E+04	1.95E+04	0.	1.17E+03	0.	9.44+06	2.28E+03		
CE-144	2.52E+06	9.95E+05	0.	6.80E+04	0.	1.04E+08	1.36E+05		

Note: The units for C-14 and H-3 are (MREM/YR Per $\mu \text{Ci/Cu}.$ Meter)

REVISION NO.:	PROCEDURE TITLE:		·····	·	<u>∲</u> }	<u> </u>	PAGE		
50	1	OFFSITE DOSE CALCULATION MANUAL (ODCM)							
PROCEDURE NO .:									
C-200		ST. LUCIE PLANT							
느		ΡΔΤΗΨΔΥ -	INHALATION	AGE GE			<u>3E3</u>		
		ORGAN DOSE	E FACTOR (M						
ONGAN DOSE FACTOR (MINEW/TR PER DOVO, METER)									
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY		
H3	0.	7.51E+02	7.51E+02	4.96E+02	7.51E+02	7.51E+02	7.51E+02		
C-14	6.25E+03	6.25E+03	6.25E+03	1.58E+03	6.25E+03	6.25E+03	6.25E+03		
P32	6.11E+05	3.57E+04	0.	0.	0.	4.00E+04	2.32E+04		
CR51	0.	0.	2.75E+01	1.06E+01	6.66E+03	1.54E+03	4.63E+01		
MN54	0.	1.83E+04	0.	4.55E+03	6.48E+05	3.58E+04	2.91E+03		
FE59	5.44E+03	1.28E+07	0.	0.	4.70E+05	8.70E+04	4.88E+03		
CO57	0.	3.20E+02	0.	0.	1.71E+05	1.45E+04	3.10E+02		
CO58	0.	1.52E+02	0.	0.	1.13E+06	3.62E+04	2.68E+02		
CO60	0.	1.07E+03	0.	0.	6.92E+06	9.36E+04	1.88E+03		
ZN65	1.50E+04	4.77E+04	0.	3.19E+04	4.03E+05	2.47E+04	2.15E+04		
RB86	0.	6.25E+04	0.	0.	0.	7.70E+03	2.73E+04		
SR89	5.37E+04	0.	0.	0.	2.24E+06	1.69E+05	1.54E+03		
SR90	1.64E+07	0.	0.	0.	1.48E+07	3.45E+05	9.99E+05		
Y91	7.44E+04	0.	0.	0.	2.55E+06	1.78E+05	1.98E+03		
ZR95	1.41E+04	3.28E+03	0.	2.51E+04	2.12E+06	5.74E+04	2.98E+03		
NB95	1.70E+03	7.25E+02	0	3.58E+03	5.85E+05	3.32E+04	5.33E+02		
RU-103	2.16E+02	0.	0.	2.70E+03	6.33E+05	4.22E+04	8.73E+01		
RU-106	1.15E+04	0.	0.	6.18E+04	1.45E+07	4.37E+05	1.44E+03		
AG110	5.00E+03	4.63E+03	0.	9.10E+03	2.15E+06	1.40E+05	2.75E+03		

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50	OFFSITE DOSE CALCULATION MANUAL (ODCM)								
PROCEDURE NO.:									
C-200		ST. LUCIE PLANT							
	,			·		<u> </u>			
TABLE G-8									
		L PATHWAY-DC	<u>DSE CONVERSI</u>	ION FACTORS I	R(I) FOR GASE(<u>JUS DISCHARC</u>	<u>358</u>		
			INHALATION	AGE GF					
ORGAN DOSE FACTOR (MIREM/YR PER μ CI/CO. METER)									
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY		
SN-123	3.85E+04	6.44E+02	6.81E+02	0.	3.50E+06	1.49E+05	1.27E+03		
SN-126	5.85E+05	1.55E+04	4.55E+03	0.	4.33E+06	5.88E+04	2.22E+04		
SB-124	1.44E+04	2.72E+02	3.49E+01	0.	1.15E+06	1.88E+05	5.74E+03		
SB-125	3.06E+04	3.30E+02	2.72E+01	0.	1.02E+06	4.66E+04	6.14E+03		
TE 125M	5.62E+02	1.94E+02	1.61E+02	5.74E+03	4.81E+05	3.38E+04	7.62E+01		
TE 127M	5.85E+03	2.60E+03	1.52E+03	2.12E+04	4.44E+05	6.92E+04	7.25E+02		
TE 129M	1.64E+03	5.85E+02	5.40E+02	1.69E+04	1.80E+06	1.82E+05	2.60E+02		
I130	2.12E+03	6.22Ė+03	8.07E+05	9.66E+03	0.	3.56E+03	2.45E+03		
I131	4.55E+04	4.63E+04	1.54E+07	2.84E+04	0.	2.65E+03	3.50E+04		
I132	5.37E+02	1.51E+03	2.03E+05	2.40E+03	0.	1.88E+02	5.37E+02		
I133	1.68E+04	2.05E+04	5.03Ė+06	1.20E+04	0.	5.55E+03	8.03E+03		
I134	2.98E+02	7.99E+02	1.06E+05	1.27E+03	0.	4.66E-01	2.85E+02		
I135	1.24E+03	3.23E+03	4.33E+05	5.14E+03	0.	2.43E+03	1.19E+03		
CS-134	6.22E+05	9.95E+05	0.	1.33E+05	1.19E+05	3.77E+03	2.23E+05		
CS-136	1.81E+04	6.77E+04	0.	3.96E+04	5.55E+03	5.40E+03	5.14E+04		
CS-137	8.66E+05	7.99E+05	0.	1.03E+05	1.00E+05	3.41E+03	1.25E+05		
BA-140	7.14E+03	4.66E+00	0.	7.73E+00	1.74E+06	9.92E+03	4.22E+02		
CE-141	3.13Ė+03	1.57E+03	0.	2.90E+03	5.14E+05	5.44E+04	2.33E+02		
CE-144	5.81E+05	1.82E+05	Q.	3.92E+05	1.23E+07	4.00E+05	3.10E+04		
REVISION NO .:	PROCEDURE TITLE:				· · · · · · · · · · · · · · · · · · ·	·	PAGE:		
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50		OFFSIT	TE DOSE CALC	ULATION MANU	AL (ODCM)		101 -6 001		
PROCEDURE NO.:	7		•						
C-200			ST. LU	ICIE PLANT					
· · · · · · · · · · · · · · · · · · ·	-,- <u>-</u>	<u> </u>		```````````````````````````````					
			TABL	_E G-9					
		<u>. PATHWAY-DC</u>	<u>)SE CONVERSI</u>	ON FACTORS P	(I) FOR GASE	<u>DUS DISCHARC</u>	<u>JES</u>		
l	PAIHWAY-			DFORAGE)					
l	ų		ACTUR (SQ.		IR PER HUISE	C)	ļ		
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY		
H3	0.	1.57E+03	1.57E+03	1.04E+03	1.57E+03	1.57E+03	1.57E+03		
C-14	3.08E+05	3.08E+05	3.08E+05	7.75E+04	3.08E+05	3.08E+05	3.08E+05		
P32	1.82E+10	1.14E+09	0.	0.	0.	2.05E+09	7.05E+08		
CR51	0.	0.	1.82E+04	6.72E+03	4.04E+04	7.66E+06	3.05E+04		
MN54	0.	8.96E+06	0.	2.67E+06	0.	2.74E+07	1.71E+06		
FE59	3.17E+07	7.52E+07	0.	0.	2.09E+07	2.48E+08	2.86E+07		
CO57	0.	1.36E+06	0.	0.	0.	3.46E+07	2.27E+06		
CO58	0.	1.25E+07	0.	0.	0.	7.41E+07	3.76E+07		
CO60	0.	4.22E+07	0.	0.	0.	2.33E+08	1.27E+08		
ZN65	1.46E+09	4.65E+09	0.	3.11E+09	0.	2.93E+09	2.10E+09		
RB86	0.	2.77E+09	0.	0.	0.	5.45E+08	1.29E+09		
SR89	6.92E+09	0.	0.	0.	0.	2.58E+08	1.98E+08		
SR90	1.13E+11	Q.	Q.	0.	0.	1.52E+09	2.87E+10		
Y91	3.80E+04	0.	0.	0.	0.	5.05E+06	1.01E+03		
ZR95	1.06E+05	4.47E+04	0	1.86E+04	0.	7.68E+07	3.29E+04		
NB95	2.75E+05	1.18E+05	0.	4.84E+04	0.	2.03E+08	8.63E+04		
RU-103	3.99E+03	0.	0.	4.16E+03	0.	1.05E+05	1.61E+03		
RU-106	9.39E+04	0.	0.	4.20E+04	0.	1.46E+06	1.17E+04		
AG110	6.21E+07	5.75E+07	0.	1.13E+08	0.	2.35E+10	3.42E+07		

Note - the units for C---14 and H----3 are (mrem/yr per $\mu Ci/cu.$ meter)

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50		OFFSIT	E DOSE CALCI	JLATION MANU	IAL (ODCM)		182 of 231
PROCEDURE NO.:							
C-200			ST. LU	CIE PLANT			
		1		<u> </u>	· <u> </u>	· · · · · · · · · · · · · · · · · · ·	
EN				LE G-9 ON FACTORS F			256
	PATHWAY	- COWS MILK (CONTAMINATE	D FORAGE	AGE GRO	DUP - CHILD	
	C	RGAN DOSE F	ACTOR (SQ.	METER-MREM/	YR PER µCI/SE	C)	
					; 		
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
SN-123	0.	0.	0.	0.	0.	0.	0.
SN-126	1.75E+09	3.48E+07	1.01E+07	0.	4.97E+06	1.16E+09	5.25E+07
SB-124	2.75E+07	5.19E+05	6.64E+04	0.	2.13E+07	7.78E+08	1.09E+07
SB-125	3.13E+07	1.41E+06	1.18E+06	3.96E+06	2.83E+09	2.43E+08	5.99E+06
TE 125M	7.38E+07	2.00E+07	2.07E+07	7.05E+07	0.	7.12E+07	9.84E+06
TE 127M	5.18E+07	1.78E+07	1.46E+07	2.00E+08	0.	2.99E+08	6.60E+06
TE 129M	2.77E+08	7.73E+07	8.85E+07	2.70E+08	0.	3.33E+08	4.28E+07
I130	4.54E+05	1.35E+06	1.71E+08	2.09E+06	0.	1.15E+06	5.29E+05
I131	1.24E+09	1.27E+09	4.12E+11	7.74E+08	0.	1.09E+08	9.56E+08
I132	1.78E-01	4.76E-01	6.26E+01	7.58E-01	0.	8.93E-02	1.69E-01
I133	1.78E+07	2.20E+07	5.30E+09	1.29E+07	0.	8.90E+06	8.63E+06
I134	0.	0.	1.06E-09	0.	0.	0.	0.
I135	1.49E+04	3.94E+04	5.15E+06	6.26E+04	8.07E-02	4.41E+04	1.44E+04
CS-134	2.17E+10	3.65E+10	0.	4.65E+09	4.06E+09	1.97E+08	7.76E+09
CS-136	2.78E+08	1.10E+09	0.	6.11E+08	8.37E+07	1.25E+08	7.90E+08
CS-137	3.08E+10	2.98E+10	0.	3.66E+09	3.49E+09	1.81E+08	4.44E+09
BA-140	1.17E+08	1.02E+05	0.	1.22E+04	6.09E+04	7.75E+06	6.84E+06
CE-141	1.24E+05	6.22E+04	0.	9.72E+03	0.	7.80E+07	9.26E+03
CE-144	1.00E+07	3.14E+06	0.	5.67E+05	0.	8.15E+08	5.34E+05

Note - the units for C---14 and H----3 are (mrem/yr per $\mu \text{Ci/cu.}$ meter)

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50		OFFSI	TE DOSE CALC	ULATION MANU	AL (ODCM)		102 - () 21
PROCEDURE NO.:							
C-200			ST. LU	CIE PLANT	1		
<u>EŅ</u>	IVIRONMENTAL PATHWAY - C	<u>- PATHWAY-DO</u> GOATS MILK PRGAN DOSE F	TABL DSE CONVERS (CONTAMINATI ACTOR (SQ.	E G-10 ION FACTORS F ED FORAGE) METER-MREM/	(I) FOR GASE AGE GR YR PER μCI/SE	DUS DISCHAR OUP - CHILD C)	GES
NUCLIDE	PONE		THYPOID	KIDNEY			
<u> </u>		3.2007+05	3.20E+03	2.11E+03	3.20E+03	3.20E+03	3.20E+03
<u> </u>	3.08E+05	3.08=+05	3.062+05	7.75±+04	3.086+05	3.08E+00	3.08E+05
P32	2.19E+10	1.37E+09		0.075.00		2.46E+09	8.46E+08
CR51		0.	2.19E+03	8.07E+02	4.85±+03	9.19E+05	3.66E+03
MN54	0.	1.08E+06	0.	3.20E+05	0	3.29E+06	2.05E+05
FE59	4.12E+ <u>05</u>	9.78E+05	0.	0.	2.72E+05	3.23E+06	3.72E+05
CO57	0.	1.64E+05	0.	0.	0	4.15E+06	2.72E+05
CO58	0.	1.50E+06	0.	0.	0.	8.90E+06	4.51E+06
CO60	0.	5.06E+06	Q.	0.	0.	2.80E+07	1.52E+07
ZN65	1.76E+08	5.57E+08	Ó.	3.73E+08	0.	3.51E+08	2.52E+08
RB86	0.	3.32E+08	0.	0.	0.	6.54E+07	1.55E+08
SR89	1.45E+10	0.	0.	0.	0.	5.43E+08	4.16E+08
SR90	2.37E+11	0.	0.	0.	0.	3.16E+09	6.02E+10
Y91	4.56E+03	0.	0.	0.	0.	6.06E+05	1.22E+02
ZR95	1.27E+04	5.37E+03	0.	2.23E+03	0.	9.22E+06	3.96E+03
NB95	3.30E+04	1.41E+04	0.	5.81E+03	0.	2.44E+07	1.04E+04
RU-103	4.79E+02	0.	0.	4.99E+02	0.	1.26E+04	1.94E+02
RU-106	1.13E+04	0.	0.	5.04E+03	0.	1.75E+05	1.40E+03
AG110	7.45E+06	6.90E+06	0.	1.36E+07	0.	2.81E+09	4.10E+06

Note - the units for C---14 and H----3 are (mrem/yr per $\mu \text{Ci/cu.}$ meter)

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50		OFFSI	TE DOSE CALC	ULATION MANU	JAL (ODCM)		184 of 231
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C-200			ST. LU	ICIE PLANT			
<u>EN</u>	<u>IVIRONMENTAL</u> PATHWAY - C	<u>- PATHWAY-DO</u> GOATS MILK (ORGAN DOSE F	TABL DSE CONVERS CONTAMINATI ACTOR (SQ.	E G-10 ION FACTORS ED FORAGE) METER-MREM/	R(I) FOR GASE(AGE GR YR PER μCI/SE	DUS DISCHAR(OUP - CHILD C)	GES
NUCLIDE	BONE			KIDNEY	LUNG	GLU	
SN-123					0	0	
SN-126	2 10E+08	<u>4 17F+06</u>	1 22E+06	0	5.97E+05	1 40F+08	6.30E+06
SB-124	3 30E+06	6 22E+04	7 97E+03	0	2.56E+06	9 33E+07	1.30E+06
SB-125	3 75E+06	1 70E+05	1 43E+05	4 76E+05	3 40E+08	2.92F+07	7 19E+05
TE 125M	8.85E+06	2 40E+06	2 49E+06	8 46E+06	0.102,00	8 54E+06	1 18E+06
TE 127M	6.21E+06	2.14E+06	1.75E+06	2.40E+07	0	3.58E+07	7.92E+05
TE 129M	3.32E+07	9.27E+06	1.06E+07	3.23E+07	0.	4.00E+07	5.15E+06
I130	5.45E+05	1.61E+06	2.05E+08	2.51E+06	0.	1.38E+06	6.35E+05
I131	1.48E+09	1.52E+09	4.94E+11	9.28E+08	0.	1.30E+08	1.15E+09
I132	2.13E-01	5.71E-01	7.51E+01	9.10E-01	0.	1.07E-01	2.03E-01
I133	2.14E+07	2.64E+07	6.36E+09	1.55E+07	0.	1.07E+07	1.04E+07
I134	0.	0.	1.27E-09	0.	0.	0.	0.
I135	1.79E+04	4.72E+04	6.18E+06	7.51E+04	2.42E-01	5.29E+04	1.73E+04
CS-134	6.50E+10	1.10E+11	0.	1.39E+10	1.22E+10	5.92E+08	2.33E+10
CS-136	8.34E+08	3.29E+09	0.	1.83E+09	2.51E+08	3.74E+08	2.37E+09
CS-137	9.23E+10	8.93E+10	0.	1.10E+10	1.05E+10	5.44E+08	1.33E+10
BA-140	1.40E+07	1.23E+04	0.	1.47E+03	7.31E+03	9.30E+05	8.21E+05
CE-141	1.49E+04	7.46E+03	0.	1.17E+03	0.	9.36E+06	1.11E+03
CE-144	1.20E+06	3.76E+05	0.	6.80E+04	0.	9.78E+07	6.41E+04

Note - the units for C---14 and H----3 are (mrem/yr per $\mu Ci/cu.$ meter)

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50		OFFSIT	E DOSE CALC	ULATION MANU	AL (ODCM)		195 of 221
PROCEDURE NO.:							
C-200			ST. LU	CIE PLANT		,	
			TADI				
FN				ON FACTORS F			FS
<u></u>	PATHW	Y - MEAT (CO	NTAMINATED F	ORAGE)	AGE GROUP	P - CHILD	
	0	RGAN DOSE F.	ACTOR (SQ.	METER-MREM/	YR PER µCI/SE	C)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNĠ	GI-LLI	WHOLE BODY
H3	0.	2.33E+02	2.33E+02	1.54E+02	2.33E+02	2.33E+02	2.33E+02
C-14	9.87Ė+04	9.87E+04	9.87E+04	2.49E+04	9.87E+04	9.87E+04	9.87E+04
P32	1.74E+09	1.09E+08	0.	0.	0.	1.96E+08	6.73E+07
CR51	0.	0.	1.58E+03	5.82E+02	3.50E+03	6.63E+05	2.64E+03
MN54	0.	3.42E+06	0.	1.02E+06	0.	1.05E+07	6.54E+05
FE59	9.95E+07	2.36E+08	0.	0.	6.55E+07	7.79E+08	8.98E+07
CO57	0.	2.10E+06	0.	0.	0.	5.33E+07	3.50E+06
CO58	0.	1.69E+07	0.	0.	0.	1.00E+08	5.10E+07
CO60	0	6.77E+07	0.	0.	0.	3.75E+08	2.03E+08
ZN65	1.33E+08	4.22E+08	0.	2.82E+08	0.	2.66E+08	1.91E+08
RB86	0.	1.82E+08	0.	0.	0.	3.59E+07	8.50E+07
SR89	5.04E+08	0.	0.	0.	0.	1.88E+07	1.44E+07
SR90	1.05E+10	0.	0.	0.	0.	7.02E+08	2.67E+09
Y91	1.76E+06	0.	0.	0.	0.	2.33E+08	4.69E+04
ZR95	4.62E+06	1.51E+06	0.	7.47E+05	0.	2.22E+09	1.20E+06
NB95	2.68E+06	1.15E+06	0.	4.72E+05	0.	1.98E+09	8.41E+05
RU-103	1.45E+08	0.	0.	1.51E+08	0.	3.81E+09	5.87E+07
RU-106	4.51E+09	Ó.	0.	2.02E+09	0.	7.01E+10	5.61E+08
AG110	2.50E+06	2.31E+06	0.	4.55E+06	0.	9.44E+08	1.38E+06

Note - the units for C---14 and H----3 are (mrem/yr per μ Ci/cu. meter)

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50 EDURE NO.:	4	OFFSIT	E DOSE CALCU	JLATION MANU	AL (ODCM)		186 of
C-200	,		ST. LU				
EN	VIRONMENTAL	_ PATHWAY-DO		E G-11 ON FACTORS F	R(I) FOR GASEC	OUS DISCHARG	ES
	PATHW/ C	ay - Meat (Co Prgan Dose F.	NTAMINATED F ACTOR (SQ. 1	ORAGE) METER-MREM/ [^]	AGE GROUF Ϋ́R PER μCI/SE	? - CHILD C)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
SN-123	0.	0.	0.	0.	0.	0.	0.
SN-126	6.92E+09	1.37E+08	4.02E+07	0.	2.41E+06	2.31E+09	1.98E+08
SB-124	7.40E+06	1.40E+05	1.79E+04	0.	5.74E+06	2.10E+08	2.93E+06
SB-125	7.66E+07	1.84E+07	1.90E+07	6.47E+07	9.26E+08	1.44E+08	1.08E+07
TE 125M	5.69E+08	1.54E+08	1.60E+08	5.44E+08	0.	5.49E+08	7.59E+07
TE 127M	4.40E+08	1.51E+08	1.24E+08	1.70E+09	0.	2.54E+09	5.61E+07
TE 129M	1.84E+09	5.12E+08	5.87E+08	1.78E+09	0.	2.21E+09	2.84E+08
I130	8.87E-07	2.63E-06	3.34E-04	4.08E-06	0.	2.25E-06	1.03E-06
I131	1.58E+07	1.62E+07	5.25E+09	9.86E+06	0.	1.38E+06	1.22E+07
I132	0.	0.	0.	0.	0.	0.	0.
I133	6.86E-01	8.47E-01	2.04E+02	4.97E-01	0.	3.43E-01	3.33E-01
I134	0.	0.	0.	0.	0.	0.	0.
I135	3.21E-02	2.96E-02	0.	1.12E-02	3.37E-03	6.92E-04	1.32E-02
CS-134	8.83E+08	1.49E+09	0.	1.89E+08	1.65E+08	8.04E+06	3.16E+08
CS-136	4.41E+06	1.74E+07	0.	9.69E+06	1.33E+06	1.98E+06	1.25E+07
CS-137	1.27E+09	1.23E+09	0.	1.51E+08	1.44E+08	7.50E+06	1.84E+08
BA-140	4.37E+07	3.84E+04	0.	4.59E+03	2.29E+04	6.03E+06	2.57E+06
CE-141	2.10E+04	1.05E+04	0.	1.65E+03	0.	1.32E+07	1.57E+03
CE-144	2.38E+06	7.46E+05	0.	1.35E+05	0.	1.94E+08	1.27E+05

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50		OFFSI	TE DOSE CALC	ULATION ΜΑΝΟ	IAL (ODCM)		407-6004
PROCEDURE NO.:	7		•				187 OT 231
C-200			ST. LL	ICIE PLANT			
EN	IVIRONMENTAL PATHWA C	<u>- PATHWAY-DO</u> Y - FRESH FR RGAN DOSE F	TABL DSE CONVERS UITS AND VEG ACTOR (SQ.	.E G-12 ION FACTORS F ETABLES METER-MREM/	<mark>R(I) FOR GASE</mark> AGE GROU YR PER μCI/SE	<u>OUS DISCHAR(</u> P - CHILD C)	GES
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
H3	0.	2.47E+02	2.47E+02	1.63E+02	2.47E+02	2.47E+02	2.47E+02
C-14	4.04E+04	4.04E+04	4.04E+04	1.02E+04	4.04E+04	4.04E+04	4.04E+04
P32	4.22E+08	2.64E+07	0.	0.	0.	4.74E+07	1.63E+07
CR51	0.	0.	4.68E+03	1.73E+03	1.04E+04	1.97E+06	7.83E+03
MN54	0.	1.98E+07	0.	5.89E+06	0.	6.07E+07	3.78E+06
FE59	1.48E+07	3.51E+07	0.	0.	9.75E+06	1.16E+08	1.34E+07
CO57	0.	7.53E+05	0.	0.	0.	1.91E+07	1.25E+06
CO58	0.	6.94E+06	0.	0.	0.	4.13E+07	2.09E+07
CO60	0.	2.33E+07	0.	0.	0.	1.29E+08	6.98E+07
ZN65	2.08E+07	6.59E+07	0.	4.41E+07	0.	4.15E+07	2.98E+07
RB86	0.	5.28E+07	0.	0.	0.	1.04E+07	2.46E+07
SR89	4.84E+09	0.	0.	0.	0.	1.81E+08	1.39E+08
SR90	7.79E+10	0.	0.	0.	0.	1.52E+09	1.98E+10
Y91	2.12E+06	0.	0.	0.	0.	2.82E+08	5.65E+04
ZR95	4.06E+05	9.87E+04	0.	6.07E+04	0.	1.08E+08	8.81E+04
NB95	6.20E+04	2.64E+04	0.	1.09E+04	0.	4.58E+07	1.94E+04
RU-103	2.24E+06	0.	0.	2.34E+06	0.	5.88E+07	9.05E+05
RU-106	5.19E+07	0.	0.	2.32E+07	0.	8.07E+08	6.46E+06
AG110	6.87E+05	6.36E+05	0.	1.25E+06	0.	2.59E+08	3.78E+05

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REVISION NO .:	PROCEDURE TITLE:						PAGE
50	ĺ	OFFSI	FE DOSE CALC	ULATION MANU	IAL (ODCM)		100 - (001
PROCEDURE NO.:	1			I			188 01 231
C-200			ST. LU	ICIE PLANT			
	I		<u>.</u>	'		;,	
				E G-12			
		<u>PAIHWAY-DU</u>	UTS AND VEC	ION FACTORS	ACE CROU		<u>555</u>
				EIADLES METED MDEM/			
	Ĺ		ACIUN (SQ.		ΤΚΡΕΚ μοι/δε	0)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LŲNG	GI-LLI	WHOLE BODY
SN-123	1.71E-05	2.14E-07	2.26E-07	0.	0.	8.50E-06	4.21E-07
SN-126	3.87E+08	7.68E+06	2.25E+06	0.	1.75E+06	3.44E+08	1.19E+07
SB-124	1.02E+07	1.93E+05	2.47E+04	0.	7.93E+06	2.89E+08	4.04E+06
SB-125	1.22E+07	6.99E+05	6.22E+05	2.09E+06	1.04E+09	9.02E+07	2.29E+06
TE 125M	4.12E+07	1.12E+07	1.16E+07	3.94E+07	0.	3.97E+07	5.49E+06
TE 127M	2.88E+07	9.90E+06	8.09E+06	1.11E+08	0.	1.65E+08	3.67E+06
TE 129M	1.56Ė+08	4.35E+07	4.99E+07	1.51E+08	0.	1.88E+08	2.41E+07
I130	1.60E+05	4.73E+05	6.02E+07	7.35E+05	0.	4.05E+05	1.86E+05
I131	1.24E+08	1.27E+08	4.13E+10	7.75E+07	0.	1.09E+07	9.58E+07
I132	2.26E+01	6.05E+01	7.97E+03	9.65E+01	0.	1.14E+01	2.15E+01
I133	3.61E+06	4.46E+06	1.08E+09	2.62E+06	0.	1.81E+06	1.75E+06
I134	4.18E-05	1.14E-04	1.47E-02	1.81E-04	0.	9.89E-08	4.06E-05
I135	1.64E+04	4.33E+04	5.67E+06	6.89E+04	3.51E-03	4.85E+04	1.59E+04
CS-134	9.97E+08	1.68E+09	0.	2.14E+08	1.87E+08	9.08E+06	3.57E+08
CS-136	1.35E+07	5.32E+07	0.	2.96E+07	4.06E+06	6.05E+06	3.83E+07
CS-137	1.41E+09	1.37E+09	Q.	1.68E+08	1.60E+08	8.34E+06	2.04E+08
BA-140	1.70E+08	1.56E+05	0.	1.78E+04	8.87E+04	2.08E+08	9.96E+06
CE-141	1.17E+05	5.84E+04	0.	9.13E+03	0.	7.33E+07	8.69E+03
CE-144	9.23E+06	2.89É+06	0.	5.22E+05	0.	7.51E+08	4.92E+05

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50		OFFSIT	LE DOSE CALC	ULATION MANU	IAL (ODCM)		180 of 231		
PROCEDURE NO.:		,							
C-200			ST. LUCIE PLANT						
EI	NVIRONMENTA	L PATHWAY-DC	TABL	E G-13 ION FACTORS I	R(I) FOR GASE		<u>SES</u>		
		ORGAN DOSE	HALATION E FACTOR (M	AGE GRO ί IREM/YR PER μ'	JP - TEENAGER CI/CU. METER)	र			
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY		
H3	0.	8.48E+02	8,48E+02	1.07E+03	8.48E+02	8.48E+02	8.48E+02		
C-14	4.58E+03	4.53E+03	4.53E+03	3.42E+03	4.53E+03	4.58E+03	4.53E+03		
P32	1.32E+06	7.72E+04	0.	0.	0.	8.64E+04	5.02E+04		
CR51	0.	0.	5.95E+01	2.28E+01	1.44E+04	3.32E+03	1.00E+02		
MN54	0.	3.96E+04	0.	9.84E+03	1.40E+06	7.74E+04	6.30E+03		
FE59	1.18E+04	2.78E+07	0.	0.	1.02E+06	1.88E+05	1.06E+04		
CO57	0.	6.92E+02	0.	0.	3.70E+05	3.14E+04	6.71E+02		
CO58	0.	1.76E+02	0.	0.	1.37E+06	9.52E+04	2.34E+02		
CO60	0.	1.24E+03	0.	0.	8.56E+06	2.35E+05	1.65E+03		
ZN65	3.24E+04	1.03E+05	0.	6.90E+04	8.72E+05	5.34E+04	4.66E+04		
RB86	0.	1.35E+05	0.	0.	0.	1.66E+04	5.90E+04		
SR89	3.87E+04	0.	0.	0.	2.50E+06	3.54E+05	1.11E+03		
SR90	1.18E+07	0.	0.	0.	1.66E+07	7.24E+05	7.23E+05		
Y91	5.38E+04	0.	0.	0.	2.86E+06	3.74E+05	1.44E+03		
ZR95	1.09E+04	3.63E+03	0.	5.42E+04	2.56E+06	1.33E+05	2.54E+03		
NB95	1.36E+03	8.24E+02	0.	7.74E+03	7.17E+05	8.80E+04	4.62E+02		
RU-103	1.63E+02	0.	0 .	5.83E+03	7.51E+05	9.44E+04	7.32E+01		
RU-106	8.40E+03	0.	Ó.	1.34E+05	1.64E+07	9.28E+05	1.06E+03		
AG110	1.08E+04	1.00E+04	0.	1.97E+04	4.64E+06	3.02E+05	5.94E+03		

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50		OFFSI	E DOSE CALC	ULATION MANU	JAL (ODCM)		
PROCEDURE NO.:					\ /		190 of 231
C-200			ST. LU	ICIE PLANT			
		<u></u> !				_,,_,, ,	
			TABL	.E G-13			
<u><u>El</u></u>	NVIRONMENTAL	<u>PATHWAY-DC</u>	DSE CONVERS	ION FACTORS	R(I) FOR GASE	DUS DISCHAR	<u>GES</u>
		PATHWAY - IN	HALATION	AGE GRO	UP - TEENAGE	र	
1		ORGAN DOSE	FACTOR (M	ΙΚΕΜ/ΥΚ ΡΕΚ μ	CI/CU. METER)		
NUCLIDE	BONE	1 IVFR	THYROID	KIDNEY	LUNG	GLU	
SN-123	2 79F+04	6 14E+02	4 92E+02	0	3.91E+06	3 13E+05	9 20E+02
SN-126	1 26E+06	3 34E+04	9.84E+03	0	9.36E+06	1 27E+05	4 80E+04
SB-124	3 12E+04	5 89E+02	7.55E+01	0	2.48E+06	4.06E+05	1 24E+04
SB-125	6.61E+04	7 13E+02	5.87E+01	0	2 20E+06	1.01E+05	1.33E+04
TE 125M	4 07F+02	1 86E+02	1 17E+02	1 24F+04	5.36E+05	7.08E+04	5 53E+01
TE 127M	1 26F+04	5.62E+02	3 29E+03	4.58E+04	9.60E+05	1.50E+05	1.57E+03
TE 129M	1.19E+03	5.64E+02	3,90E+02	3.66E+04	2.03E+06	3.84E+05	1.92E+02
I130	4.58E+03	1.34E+04	1.74E+06	2.09E+04	0.	7.69E+03	5.29E+03
1131	3.37E+04	4.72E+04	1.39E+07	6.14E+04	0.	5.96E+03	2.82E+04
I132	1.16E+03	3.26E+03	4.38E+05	5.19E+03	0.	4.06E+02	1.16E+03
I133	1.23E+04	2.06E+04	3.83E+06	2.60E+04	0.	1.00E+04	6.34E+03
I134	6.45E+02	1.73E+03	2.30E+05	2.75E+03	0.	1.01E+00	6.16E+02
I135	2.69E+03	6.99E+03	9.36E+05	1.11E+04	0.	5.25E+03	2.58E+03
CS-134	4.83E+05	1.10E+06	0.	2.88E+05	1.44E+05	8.96E+03	5.44E+05
CS-136	3.91E+04	1.46E+05	0.	8.56E+04	1.20E+04	1.17E+04	1.11E+05
CS-137	6.42E+05	8.24E+05	0.	2.22E+05	1.18E+05	7.68E+03	3.03E+05
BA-140	5.30E+03	4.85E+00	0.	1.67E+01	2.02E+06	2.12E+04	3.42E+02
CE-141	2.27E+03	1.52E+03	0.	6.26E+03	5.83E+05	1.14E+05	1.74E+02
CE-144	4.19E+05	1.74E+05	0.	8.48E+05	1.38E+07	8.40E+05	2.24E+04

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REVISION NO.:	PROCEDURE TITLE:	· 1	I				PAGE:
50		OFFSIT	TE DOSE CALCI	JLATION MANU	AL (ODCM)		191 of 231
PROCEDURE NO .:							
C-200			ST. LU	CIE PLANT			
		· ·	TADI				
FI				ON FACTORS F	ON FOR GASE		2E&
브	PATHWAY - C	OWS MILK (CC	NTAMINATED	FORAGE)		P - TEENAGER	
	С (С	RGAN DOSE E	ACTOR (SQ	METER-MREM/	YR PER UCI/SE	C)	1
	5					0)	
NUCLIDE	BONE	LIVER	THYRÓID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
H3	0.	9.93E+02	9.93E+02	1.26E+03	9.93E+02	9.93E+02	9.93E+02
C-14	1.25E+05	1.25E+05	1.25E+05	9.39E+04	1.25E+05	1.25E+05	1.25E+05
P32	2.21E+10	1.38E+09	0.	0.	0.	2.48E+09	8.54E+08
CR51	0.	Q.	2.21E+04	8.15E+03	4.90E+04	9.29E+06	3.69E+04
MN54	0.	1.09E+07	0.	3.23E+06	0.	3.33E+07	2.07E+06
FE59	3.84E+07	9.12E+07	0.	0.	2.53E+07	3.01E+08	3.47E+07
CO57	0.	1.65E+06	0.	0.	0.	4.19E+07	2.75E+06
CO58	0.	8.10E+06	0.	0.	0.	1.10E+08	1.85E+07
CO60	0.	2.73E+07	0.	0.	0.	3.27E+08	6.23E+07
ZN65	1.77E+09	5.63E+09	0.	3.77E+09	0.	3.55E+09	2.55E+09
RB86	0.	3.35E+09	0.	0.	0.	6.61E+08	1.56E+09
SR89	2.80E+09	0.	0.	0.	0.	3.03E+08	8.03E+07
SR90	8.29E+10	0.	0.	0.	3.38E+06	1.76E+09	2.05E+10
Y91	1.54E+04	0.	0.	0.	0.	5.93E+06	4.12E+02
ZR95	4.78E+04	2.84E+04	0.	2.25E+04	0.	1.15E+08	1.60E+04
NB95	1.24E+05	7.46E+04	0.	5.87E+04	0.	3.05E+08	4.21E+04
RU-103	1.69E+03	0.	0.	5.04E+03	0.	1.32E+05	7.56E+02
RU-106	3.83E+04	0.	0.	5.09E+04	0.	1.73E+06	4.81E+03
AG-110	7.53E+07	6.97E+07	0.	1.37E+08	0.	2.84E+10	4.14E+07
			· · · · · ·			1	

Based on 1 μ Ci/sec release rate of each isotope in and a value of 1. for X/Q, depleted X/Q and relative deposition Note - the units for C----14 and H-----3 are (mrem/yr per μ Ci/cu. meter)

REVISION NO .:	PROCEDURE TITLE:	· · · · ·	à,			······································	PAGE:
50		OFFSI	TE DOSE CALC	ULATION MANU	JAL (ODCM)		102 of 221
PROCEDURE NO .:							192 01 231
C-200			ST. LU	ICIE PLANT			
					·		
_			TABL	E G-14			
<u>E</u>		L PATHWAY-DO	DSE CONVERSI	ION FACTORS I	R(I) FOR GASE	DUS DISCHAR	<u>GES</u>
	PATHWAY - C						
	Ĺ	DRGAN DOSE F	ACTOR (SQ.		YR PER µCI/SE	(C)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
SN-123	0.	0.	0.	0.	0.	0.	0.
SN-126	2.12E+09	4.21E+07	1.24E+07	0.	6.03E+06	1.41Ė+09	6.37E+07
SB-124	3.33E+07	6.29E+05	8.05E+04	0.	2.59E+07	9.43E+08	1.32E+07
SB-125	3.45E+07	9.58E+05	5.05Ė+05	4.80E+06	3.43E+09	2.95E+08	6.82E+06
TE 125M	3.00E+07	1.08E+07	8.47E+06	8.55E+07	0.	8.39E+07	3.98E+06
TE 127M	6.02E+07	2.11E+07	1.59Ė+07	2.43E+08	0.	3.02E+08	7.45E+06
TE 129M	1.13E+08	4.18E+07	3.61E+07	3.27E+08	0.	3.93E+08	1.78E+07
I130	5.51E+05	1.63E+06	2.07E+08	2.53E+06	0.	1.40E+06	6.41E+05
I131	5.12E+08	7.24E+08	2.09E+11	9.38E+08	0.	1.37E+08	4.31E+08
I132	2.16E-01	5.76E-01	7.59E+01	9.19E-01	0.	1.08E-01	2.05E-01
I133	7.33E+06	1.24E+07	2.26E+09	1.56E+07	0.	9.02E+06	3.83E+06
I134	0.	0.	1.29E-09	0.	0.	0.	0.
I135	1.81E+04	4.77E+04	6.24E+06	7.58E+04	9.79E-02	5.34E+04	1.75E+04
CS-134	9.44E+09	2.28E+10	0.	5.63E+09	2.76E+09	2.63E+08	1.06E+10
CS-136	3.37E+08	1.33E+09	0.	7.41E+08	1.02E+08	1.51E+08	9.58E+08
CS-137	1.28E+10	1.72E+10	0.	4.43E+09	2.28E+09	2.29E+08	6.04E+09
BA-140	4.84E+07	5.95E+04	0.	1.48E+04	3.98E+04	9.16E+06	3.11E+06
CE-141	5.05E+04	3.39E+04	0.	1.18E+04	0.	9.18E+07	3.89E+03
CE-144	4.10E+06	1.68E+06	0.	6.87E+05	0.	9.65E+08	2.17E+05

Based on 1 μCi/sec release rate of each isotope in and a value of 1. for X/Q, depleted X/Q and relative deposition Note - the units for C---14 and H----3 are (m/rem/yr per μCi/cu. meter)

REVISION NO .:	PROCEDURE TITLE				·		PAGE
50		OFFSI	TE DOSË CALC	ULATION MANU	JÁL (ODCM)		100-6004
PROCEDURE NO.:			,				193 01 231
C-200			ST. LL	ICIE PLANT	ł		
		·····	TADI	E C 15			
EI		L PATHWAY-DO		ION FACTORS		OUS DISCHAR	GES
	PATHWAY - G	OATS MILK (CO	ONTAMINATED	FORAGE)	AGE GROL	JP - TEENAGEF	र २
	C	DRGAN DOSE F	ACTOR (SQ.	METER, MREM/	YR PER μCI/SE	C)	
NUCLIDE	BONÉ		THYROID	KIDNEY		GHU	
H3	0	2.03E+03	2 03E+03	2.56E+03	2 03E+03	2 03E+03	2 03E+03
C-14	1.25E+05	1.25E+05	1.25E+05	9.39E+04	1.25E+05	1.25E+05	1.25E+05
P32	2.65E+10	1.66E+09	0.	0.	0.	2.98E+09	1.03E+09
CR51	0.	0.	2.65E+03	9.78E+02	5.88E+03	1.11Ė+06	4.43E+03
MN54	0.	1.30E+06	0.	3.88E+05	0.	3.99E+06	2.49E+05
FE59	4.99E+05	1.19E+06	0.	0.	3.29E+05	3.91E+06	4.51E+05
CO57	0.	1.98E+05	0.	0.	Q.	5.03E+06	3.30E+05
CO58	0.	9.72E+05	0.	0.	0.	1.31E+07	2.22E+06
CO60	0.	3.28E+06	0.	0.	0.	3.93E+07	7.48E+06
ZN65	2.13E+08	6.76E+08	0.	4.52E+08	0.	4.26E+08	3.06E+08
RB86	0.	4.02E+08	0.	0.	0.	7.93E+07	1.88E+08
SR89	5.87E+09	0.	0.	0.	Ó.	6.37E+08	1.69E+08
SR90	1.74E+11	0.	0.	0.	4.05E+05	3.68E+09	4.30E+10
Y91	1.85E+03	0.	0.	0.	<u>0</u> .	7.11E+05	4.94E+01
ZR95	5.74E+03	3.41E+03	Q .	2.70E+03	Ó.	1.38E+07	1.93E+03
NB95	1.49E+04	8.96E+03	0.	7.05E+03	0.	3.66E+07	5.05E+03
RU-103	2.03E+02	0.	0.	6.05E+02	0.	1.58E+04	9.08E+01
RU-106	4.59E+03	0.	0.	6.11E+03	0.	2.08E+05	5.78E+02
AG110	9.04E+06	8.36E+06	0.	1.64E+07	0.	3.41E+09	4.97E+06

Based on 1 μ Ci/sec release rate of each isotope in and a value of 1. for X/Q, depleted X/Q and relative deposition Note - the units for C---14 and H----3 are (mrem/yr per μ Ci/cu. meter)

REVISION NO .:	PROCEDURE TITLE	:		· · · · · · · · · · · · · · · · · · ·			PAGE:				
50		OFFSI	TÉ DOSE CALC	ULATION MANL	JAL (ODCM)		104 of 221				
PROCEDURE NO .:											
C-200			ST. LL	ICIE PLANT							
<u> </u>		-	i			······					
	NVIRONMENTA	L PATHWAY-DO	DSE CONVERS	ION FACTORS	R(I) FOR GASE	DUS DISCHAR	<u>GES</u>				
	PATHWAY - G			FURAGE)			R				
	(JRGAN DUSE F	AUTOR (SQ.		τκ ρεκ μοι/δε	.C)					
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY				
SN-123	0.	0.	Ó.	0.	0.	0.	0.				
SN-126	2.54E+08	5.05E+06	1.48E+06	0.	7.23E+05	1.69E+08	7.64E+06				
SB-124	4.00E+06	7.54E+04	9.66E+03	0.	3.10E+06	1.13E+08	1.58E+06				
SB-125	4.14E+06	1.15E+05	6.06E+04	5.77E+05	4.12E+08	3.54E+07	8.19E+05				
TE 125M	3.61E+06	1.29E+06	1.02E+06	1.03E+07	Ó.	1.01E+07	4.78E+05				
TE 127M	7.23E+06	2.52E+06	1.91E+06	2.92E+07	0.	3.63E+07	8.94E+05				
TE 129M	1.35E+07	5.02E+06	4.34E+06	3.92E+07	0.	4.72E+07	2.13E+06				
I130	6.61E+05	1.96E+06	2.49E+08	3.04E+06	0.	1.68E+06	7.69E+05				
I131	6.15E+08	8.68E+08	2.50E+11	1.13E+09	0.	1.64E+08	5.17E+08				
I132	2.59E-01	6.92Ė-01	9.11E+01	1.10E+00	0.	1.30E-01	2.46E-01				
I133	8.79E+06	1.49E+07	2.71E+09	1.88E+07	0.	1.08Ė+07	4.59E+06				
I134	0.	0.	1.55E-09	0.	0.	0.	0.				
I135	2.17E+04	5.73E+04	7.49E+06	9.10E+04	2.94E-01	6.41E+04	2.10E+04				
CS-134	2.83E+10	6.83E+10	0.	1.69E+10	8.27E+09	7.88E+08	3.19E+10				
CS-136	1.01E+09	3.99E+09	0.	2.22E+09	3.05E+08	4.54E+08	2.87E+09				
CS-137	3.84E+10	5.16E+10	0.	1.33E+10	6.85E+09	6.88E+08	1.81E+10				
BA-140	5.81E+06	7.14E+03	0.	1.78E+03	4.78E+03	1.10E+06	3.73E+05				
CE-141	6.06E+03	4.07E+03	0.	1.41E+03	0.	1.10E+07	4.66E+02				
CE-144	4.92E+05	2.02E+05	0.	8.24E+04	0.	1.16E+08	2.61E+04				

Based on 1 μCi/sec release rate of each isotope in and a value of 1. for X/Q, depleted X/Q and relative deposition Note - the units for C---14 and H----3 are (mrem/yr per μCi/cu. meter)

REVISION NO .:	PROCEDURE TITLE:			1		<u> </u>	PAGE:
50		OFFSI	TE DOSE CALC	ULATION MANU	AL (ODCM)		405 - 6004
PROCEDURE NO.:	-				ι <i>γ</i>		195 01 231
C-200			ST. LU	CIE PLANT			
			·	<u> </u>			
				E G-16			
<u>Eľ</u>		<u>- MEAT (CONT</u>	AMINATED FOI	UN FACIURS I		JUS DISCHARU	<u>3E3</u>
		RGAN DOSE E	ACTOR (SO	METER_MREM/			
	0		A0101 (0Q.		τη τεις μοι/οε	0)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
H3	0.	1.93E+02	1.93E+02	2.44E+02	1.93E+02	1.93E+02	1.93E+02
C-14	5.23E+04	5.23E+04	5.23E+04	3.94E+04	5.23E+04	5.23E+04	5.23E+04
P32	2.76E+09	1.73E+08	0.	0.	0.	3.10E+08	1.07E+08
CR51	0.	0.	2.50E+03	9.22E+02	5.55E+03	1.05E+06	4.18E+03
MN54	0.	5.42E+06	0.	1.61E+06	0.	1.66E+07	1.04E+06
FE59	1.58E+08	3.74E+08	0.	0.	1.04E+08	1.24E+09	1.42E+08
CO57	0.	3.33E+06	0.	0.	0.	8.45E+07	5.54E+06
CO58	0.	1.44E+07	0.	0.	0.	1.94E+08	3.27E+07
CO60	0.	5.73E+07	0.	0.	0.	6.87E+08	1.31E+08
ZN65	2.11E+08	6.69E+08	0.	4.47E+08	0.	4.21E+08	3.03E+08
RB86	0.	2.89E+08	0.	0.	0.	5.69E+07	1.35E+08
SR89	2.66E+08	0.	0.	0.	0.	2.89Ë+07	7.64E+06
SR90	1.01E+10	0.	0.	0.	2.79E+08	1.02E+09	2.49E+09
Y91	9.34E+05	0.	0.	0.	0.	3.59E+08	2.49E+04
ZR95	2.67E+06	1.24E+06	0.	1.18E+06	0.	4.20E+09	7.61E+05
NB95	1.58E+06	9.51E+05	0.	7.48E+05	0.	3.88E+09	5.37E+05
RU-103	8.05E+07	0.	0.	2.40E+08	0.	6.28E+09	3.60E+07
RU-106	2.40E+09	0.	0.	3.20E+09	0.	1.09E+11	3.02E+08
AG110	3.97E+06	3.67E+06	0.	7.21E+06	0.	1.50E+09	2.18E+06

Based on 1 μ Ci/sec release rate of each isotope in and a value of 1. for X/Q, depleted X/Q and relative deposition Note - the units for C----14 and H-----3 are (mrem/yr per μ Ci/cu. meter)

/ISION NO.:	PROCEDURE TITLE:					+	PAGE:
50		OFFSI	TE DOSE CALC	JLATION MANU	IAL (ODCM)		196 of 231
DCEDURE NO .:		· · ·					
C-200			ST. LU			,	
			TABL	E G-16			
<u>E</u>	<u>NVIRONMENTAI</u>	_ PATHWAY-DO	<u>DSE CONVERSI</u>	ON FACTORS F	<u>R(I) FOR GASEC</u>	DUS DISCHAR	<u>GES</u>
	PATHWAY	- MEAT (CONT	AMINATED FOR	RAGE)	AGE GROUP -	TEENAGER	
	C	RGAN DOSE F	ACTOR (SQ.	METER-MREM/	YR PER µCI/SE	C)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNĠ	GI-LLI	WHOLE BODY
SN-123	0.	0.	0.	0.	0.	0.	0.
SN-126	1.10E+10	2.18E+08	6.38E+07	0.	3.82E+06	3.66E+09	3.14E+08
SB-124	1.17E+07	2.21E+05	2.84E+04	0.	9.11E+06	3.32E+08	4.64E+06
SB-125	5.01E+07	1.31E+07	1.02E+07	1.03E+08	1.47E+09	2.25E+08	7.60E+06
TE 125M	3.03E+08	1.08E+08	8.55E+07	8.63E+08	0.	8.47E+08	4.02E+07
TE 127M	6.68E+08	2.34E+08	1.77E+08	2.69E+09	0.	3.35E+09	8.28E+07
TE 129M	9.78E+08	3.63E+08	3.13E+08	2.83E+09	0.	3.41E+09	1.53E+08
I130	1.41E-06	4.16E-06	5.30É-04	6.47E-06	0.	3.57E-06	1.64E-06
I131	8.54E+06	1.21E+07	3.48E+09	1.56E+07	0.	2.28E+06	7.19E+06
I132	0.	0.	0.	0.	0.	0.	0.
I133	3.69E-01	6.26E-01	1.14E+02	7.88E-01	0.	4.55E-01	1.93E-01
I134	0.	0.	0.	0.	0.	0,	D.
I135	5.08E-02	4.69E-02	0.	1.78E-02	5.34E-03	1.10E-03	2.08E-02
CS-134	5.03E+08	1.21E+09	0.	3.00E+08	1.47E+08	1.40E+07	5.66E+08
CS-136	6.99E+06	2.76E+07	0.	1.54E+07	2.11E+06	3.14E+06	1.99E+07
CS-137	6.92E+08	9.31E+08	0.	2.40E+08	1.24E+08	1.24E+07	3.27E+08
BA-140	2.37E+07	2.93E+04	0.	7.28E+03	1.95E+04	9.19E+06	1.53E+06
CE-141	1.12E+04	7.51E+03	0.	2.61E+03	0.	2.03E+07	8.61E+02
CE-144	1.28E+06	5.23E+05	0.	2.14E+05	0.	3.00E+08	6.76E+04

Based on 1 μCi/sec release rate of each isotope in and a value of 1. for X/Q, depleted X/Q and relative deposition Note - the units for C---14 and H----3 are (mrem/yr per μCi/cu. meter)

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REVISION NO .:	PROCEDURE TITLE:				·		PAGE:				
50		OFFSI	TE DOSE CALC	ULATION MANU	AL (ODCM)		407 - 1004				
PROCEDURE NO.:	7			1	ζ ,		197 OT 231				
C-200			ST. LU	ICIE PLÅNT							
		<u> </u>	;	······································	<u></u>						
ENVIKUNIVIENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGES											
			SAND VEGEI	ADLEJ Meted Maden//							
	ŕ	NGAN DOSE F	AGION (SQ.			0)					
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY				
H3	0.	2.09E+02	2.09E+02	2.64E+02	2.09E+02	2.09E+02	2.09E+02				
C-14	2.18E+04	2.18E+04	2.18E+04	1.64E+04	2.18E+04	2.18E+04	2.18E+04				
P32	6.81E+08	4.27E+07	0.	0.	0.	7.66E+07	2.64E+07				
CR51	0.	0.	7.56E+03	2.79E+03	1.68E+04	3.18E+06	1.27E+04				
MN54	0.	3.20E+07	Q.	9.52E+06	0.	9.80E+07	6.11E+06				
FE59	2.39E+07	5.67E+07	0.	0.	1.57E+07	1.87E+08	2.16E+07				
CO57	0.	1.22E+06	0.	0.	0.	3.09E+07	2.02E+06				
CO58	0.	6.01E+06	0.	0.	0.	8.12E+07	1.37E+07				
CO60	0.	2.01E+07	0.	0.	0.	2.41E+08	4.58E+07				
ZN65	3.35E+07	1.06E+08	0.	7.12E+07	0.	6.70E+07	4.82E+07				
RB86	0.	8.52E+07	0.	0.	0.	1.68E+07	3.97E+07				
SR89	2.61E+09	<u></u> .	0.	0.	0.	2.83E+08	7.48E+07				
SR90	7.61E+10	0.	0	0.	2.41E+08	2.31E+09	1.88E+10				
Y91	1.15E+06	0.	0.	0.	0.	4.41E+08	3.06E+04				
ZR95	2.35E+05	8.19E+04	0.	9.81E+04	0.	1.92E+08	5.61E+04				
NB95	3.72E+04	2.24E+04	0.	1.76E+04	0.	9.14E+07	1.26E+04				
RU-103	1.27E+06	0.	0.	3.77E+06	0.	9.87E+07	5.66E+05				
RU-106	2.82E+07	0.	0.	3.75E+07	0.	1.28E+09	3.54E+06				
AG110	1.11Ė+06	1.03E+06	0.	2.02E+06	0.	4.19E+08	6.10E+05				

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50		OFFSI	TE DOSE CALC	ULATION MANU	IAL (ODCM)		
PROCEDURE NO.:							
C-200			ST. LU	CIE PLANT			
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			TABL	E G-17			
<u>EN</u>		<u> PATHWAY-DO</u>	DSE CONVERSI	ON FACTORS I	R(I) FOR GASE	DUS DISCHAR	<u>GES</u>
	PATHWAY		S AND VEGEL	ABLES			
	Ĺ		ACTOR (SQ.		rr per µci/se	0)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
SN-123	9.25E-06	1.5 ['] 3E-07	1;22E-07	0.	0.	1.33E-05	2.28E-07
SN-126	6.25E+08	1.24E+07	3.64E+06	0.	2.83E+06	5.55E+08	1.94E+07
SB-124	1.65E+07	3.12E+05	3.99E+04	0.	1.28E+07	4.67E+08	6.53E+06
SB-125	1.73E+07	5.97E+05	3.48E+05	3.38E+06	1.68E+09	1.45E+08	3.40E+06
TE 125M	2.23E+07	7.99E+06	6.30E+06	6.36E+07	0.	6.24E+07	2.96E+06
TE 127M	4.46E+07	1.55E+07	1.18E+07	1.80E+08	0.	2.23E+08	5.51E+06
TE 129M	8.46E+07	3.14E+07	2.71E+07	2.45E+08	0.	2.95E+08	1.33E+07
I130	2.58E+05	7.64E+05	9.72E+07	1.19E+06	0.	6.55E+05	3.00E+05
I131	6.84E+07	9.66E+07	2.79E+10	1.25E+08	0.	1.83E+07	5.76E+07
I132	3.65E+01	9.77E+01	1.29E+04	1.56E+02	0.	1.84E+01	3.47E+01
I133	1.98E+06	3.36E+06	6.10E+08	4.23E+06	0.	2.44E+06	1.04E+06
I134	6.75E-05	1.83E-04	2.38E-02	2.92E-04	0.	1.60E-07	6.56E-05
I135	2.65E+04	7.00E+04	9.15E+06	1.11E+05	5.67E-03	7.84E+04	2.57E+04
CS-134	5.79E+08	1.40E+09	0.	3.45E+08	1.69E+08	1.61E+07	6.52E+08
CS-136	2.18E+07	8.60E+07	0.	4.78E+07	6.56E+06	9.77E+06	6.19E+07
CS-137	7.83E+08	1.05E+09	0.	2.72E+08	1.40E+08	1.41E+07	3.70E+08
BA-140	9.38E+07	1.21E+05	0.	2.88E+04	7.73E+04	3.19E+08	6.04E+06
CE-141	6.32E+04	4.24E+04	0.	1.47E+04	0.	1.15E+08	4.86E+03
CE-144	5.03E+06	2.06E+06	0.	8.43E+05	0.	1.19E+09	2.67E+05

REVISION NO.:	PROCEDURE TITLE:		i ,	i		— ↓ ·; · · · · ·	PAGE					
50		OFFSI	TE DOSE CALC	ULATION MANU	IAL (ODĊM)		1.99 of 231					
PROCEDURE NO.:												
C-200			ST. LU	ICIE PLANT								
TABLE G-18 ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGES												
		PATHWAY -	INHALATION	AGE GR	OUP - ADULT		1					
		ORGAN DOSE	EFACTOR (M	IREM/Ϋ́́R PER μ'	CI/CU. METER)							
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY					
H3	0.	1.07E+03	1.07E+03	1.07E+03	1.07E+03	1.07E+03	1.07E+03					
C-14	1.82E+04	3.42E+04	3.42E+03	3.42E+03	3.42E+03	3.42E+03	3.42E+03					
P32	1.32E+06	7.72E+04	0.	0.	0.	8.64E+04	5.02E+04					
CR51	0.	0.	5.95E+01	2.28E+01	1.44E+04	3.32E+03	1.00E+02					
 MN54	0.	3.96E+04	0.	9.84E+03	1.40E+06	7.74E+04	6.30E+03					
FE59	1.18E+04	2.78E+07	Q.	0.	1.02E+06	1.88E+05	1.06E+04					
CO57	0.	6.92E+02	0.	0.	3.70E+05	3.14E+04	6.71E+02					
CO58	0.	1.58E+03	Q.	0.	9.28E+05	1.06E+05	2.07E+03					
CO60	0.	1.15E+04	0.	0.	5.98E+06	2.85E+05	1.48E+04					
ZN65	3.24E+04	1.03E+05	0.	6.90E+04	8.72E+05	5.34E+04	4.66E+04					
RB86	0.	1.35E+05	0.	0.	0.	1.66E+04	5.90E+04					
SR89	3.04E+05	0.	0.	0.	1.40E+06	3.50E+05	8.72E+03					
SR90	9.92E+07	0.	0.	0.	9.60E+06	7.22E+05	6.10E+06					
Y91	4.62E+05	0.	0.	0.	1.70E+06	3.85E+05	1.24E+04					
ZR95	1.07E+05	3.44E+04	0.	5.42E+04	1.78E+06	1.50E+05	2.33E+04					
NB95	1.41E+04	7.82E+03	0.	7.74E+03	5.06E+05	1.04E+05	4.21E+03					
RU-103	1.53E+03	0.	0.	5.83E+03	5.06E+05	1.10E+05	6.58E+02					
RU-106	6.91E+04	0.	0.	1.34E+05	9.44E+06	9.12E+05	8.72E+03					
AG110	1.08E+04	1.00E+04	0.	1.97E+04	4.64E+06	3.02E+05	5.94E+03					

REVISION NO.:	PROCEDURE TITLE:			· · ·			PAGE:
50		OFFSI		ULATION MANU	JAL (ODCM)		
PROCEDURE NO.:	-				(, ,		200 of 231
C-200			ST. LU	CIE PLANT			
	''''					· · · · · · · · · · · · · · · · · · ·	
-				E G-18			
	NVIRONMENTAL		DSE CONVERSI	<u>ON FACTORS I</u>		DUS DISCHAR	<u>352</u>
		ORGAN DUSE	FACTOR (IVI	KEIVII I K PEK µ	CI/CU. METER)		
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
SN-123	2.42E+05	5.33E+03	4.53E+03	0.	2.30E+06	3.14E+05	7.86E+03
SN-126	1.26E+06	3.34E+04	9.84E+03	0.	9.36E+06	1.27E+05	4.80E+04
SB-124	3.12E+04	5.89E+02	7.55E+01	0.	2.48E+06	4.06E+05	1.24E+04
SB-125	6.61E+04	7.13E+02	5.87E+01	0.	2.20E+06	1.01E+05	1.33E+04
TE 125M	3.42E+03	1.58E+03	1.05E+03	1.24E+04	3.14E+05	7.06E+04	4.67E+02
TE 127M	1.26E+04	5.62E+03	3.29E+03	4.58E+04	9.60E+05	1.50E+05	1.57E+03
TE 129M	9.76E+03	4.67E+03	3.44E+03	3.66E+04	1.16E+06	3.83E+05	1.58E+03
I130	4.58E+03	1.34E+04	1.74E+06	2.09E+04	0.	7.69E+03	5.29E+03
I131	2.52E+04	3.58E+04	1.19E+07	6.14E+04	0.	6.28E+03	2.05E+04
I132	1.16E+03	3.26E+03	4.38E+05	5.19E+03	0.	4.06E+02	1.16E+03
I133	8.64E+03	1.49E+04	2.93E+06	2.60E+04	0.	8.72E+03	4.54E+03
I134	6.45E+02	1.73E+03	2.30E+05	2.75E+03	0.	1.01E+00	6.16E+02
I135	2.69E+03	6.99E+03	9.36E+05	1.11E+04	0.	5.25E+03	2.58E+03
CS-134	3.74E+05	8.48E+05	0.	2.88E+05	9.76E+04	1.04E+04	7.29E+05
CS-136	3.91E+04	1.46E+05	0.	8.56E+04	1.20E+04	1.17E+04	1.11E+05
CS-137	4.78E+05	6.22E+05	0.	2.22E+05	7.53E+04	8.40E+03	4.29E+05
BA-140	3.90E+04	4.90E+01	0.	1.67E+01	1.27E+06	2.18E+05	2.57E+03
CE-141	1.99E+04	1.35E+04	0.	6.26E+03	3.62E+05	1.20E+05	1.53E+03
CE-144	3.43E+06	1.43E+06	0.	8.48E+05	7.78E+06	8.16E+05	1.84E+05

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REVISION NO.:	PROCEDURE TITLE:	,,, I			·····	•i	PAGE:				
50		OFFSIT	TE DOSE CALCI	ULATION MANU	AL (ODCM)						
PROCEDURE NO.:											
C-200		ST. LUCIE PLANT									
			TABL	E G-19							
EN		- PATHWAY-DC	SE CONVERSI	ON FACTORS F	R(I) FOR GASE	OUS DISCHARC	JES				
	PATHWAY -	COWS MILK (CONTAMINATE	D FORAGE)	AGE GRC	OUP - ADULT					
	0	RGAN DOSE F	ACTOR (SQ.	METER-MREM/	YR PER µCl/SE	C)					
NUCLIDE	BONE	LIVER	THYROID	KIDŅEY	LUNG	GI-LLI	WHOLE BODY				
H3	0.	9.73E+02	9.73E+02	9.73E+02	9.73E+02	9.73E+02	9.73E+02				
C-14	3.63E+05	7.28E+04	7.28E+04	7.28E+04	7.28E+04	7.28E+04	7.28E+04				
P32	1.71E+10	1.07E+09	0.	0.	0.	1.92E+09	6.62E+08				
CR51	0.	0.	1.71E+04	6.32E+03	3.80E+04	7.20E+06	2.86E+04				
MN54	0.	8.41E+06	0,	2.50E+06	0.	2.58E+07	1.61E+06				
FE59	2.98E+07	7.06E+07	0.	0.	1.96E+07	2.33E+08	2.69E+07				
CO57	0.	1.28E+06	0.	0.	0.	3.25E+07	2.13E+06				
CO58	0.	4.72E+06	0.	0.	0.	9.56E+07	1.06E+07				
CO60	0.	1.65E+07	Ó.	0.	0.	3.08E+08	3.62E+07				
ZN65	1.37E+09	4.36E+09	Ó.	2.92E+09	0.	2.75E+09	1.98E+09				
RB86	0.	2.60E+09	0.	0.	0.	5.12E+08	1.21E+09				
SR89	1.46E+09	0.	0.	0.	0.	2.33E+08	4.17E+07				
SR90	4.70E+10	0.	0.	0.	0.	6.37E+08	1.15E+10				
Y91	8.60E+03	0.	0.	0.	0.	4.73E+06	2.31E+02				
ZR95	3.18E+04	1.75E+04	0.	1.75E+04	0.	1.05E+08	6.95E+03				
NB95	8.26E+04	4.59E+04	0.	4.55E+04	0.	2.79E+08	1.80E+04				
RU-103	1.02E+03	0.	0.	3.91E+03	0.	1.19E+05	4.41E+02				
RU-106	2.04E+04	Ó.	0.	3.95E+04	0.	1.32E+06	2.58E+03				
AG110	5.84E+07	5.40E+07	0.	1.06E+08	0.	2.20E+10	3.21E+07				

Based on 1 μCi/sec release rate of each isotope in and a value of 1. for X/Q, depleted X/Q and relative deposition Note - the units for C---14 and H----3 are (mrem/yr per μCi/cu. meter)

VISION NO.:	PROCEDURE TITLE:				·		PÁGE
50		OFFSI	TE DOSE CALC	ULATION MANU	IAL (ODCM)		202 of 231
OCEDURE NO .:							
C-200		,	ST. LU				
			TABL	E G-19			
<u>E1</u>	<u>NVIRONMENTAI</u>	<u>PATHWAY-DO</u>	OSE CONVERS	ON FACTORS I	R(I) FOR GASE	DUS DISCHAR	<u>GES</u>
	PATHWAY	- COWS MILK (CONTAMINATE	D FORAGE)			
	Ĺ	RGAN DOSE F	ACTOR (SQ.		YR PER µCI/SE	C)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
SN-123	0.	0.	0.	0.	0.	0.	ρ.
SN-126	1.65E+09	3.27E+07	9.56E+06	0.	4.67E+06	1.09E+09	4.94E+07
SB-124	2.58E+07	4.87E+05	6.24E+04	0.	2.00E+07	7.31E+08	1.02E+07
SB-125	2.64E+07	6.06E+05	2.99E+05	3.72E+06	2.66E+09	2.29E+08	5.23E+06
TE 125M	1.63E+07	5.91E+06	4.91E+06	6.63E+07	0.	6.50E+07	2.18E+06
TE 127M	4.63E+07	1.63E+07	1.21E+07	1.88E+08	0.	2.11E+08	5.72E+06
TE 129M	6.06E+07	2.27E+07	2.09E+07	2.53E+08	0.	3.04E+08	9.61E+06
I130	4.27E+05	1.26E+06	1.61E+08	1.96E+06	0.	1.08E+06	4.97E+05
I131	2.96E+08	4.25E+08	1.39E+11	7.27E+08	0.	1.12E+08	2.43E+08
I132	1.67E-01	4.47E-01	5.88E+01	7.12E-01	0.	8.39E-02	1.59E-01
I133	4.00E+06	6.94E+06	1.33E+09	1.21E+07	0.	6.10E+06	2.12E+06
I134	0.	0.	9.98E-10	0.	0.	0.	0.
I135	1.40E+04	3.70E+04	4.84E+06	5.88E+04	7.58E-02	4.14E+04	1.36E+04
CS-134	5.66E+09	1.35E+10	0.	4.36E+09	1.45E+09	2.36E+08	1.10E+10
CS-136	2.61E+08	1.03E+09	0.	5.74E+08	7.87E+07	1.17E+08	7.43E+08
CS-137	7.39E+09	1.01E+10	0.	3.44E+09	1.14E+09	1.95E+08	6.62E+09
BA-140	2.69E+07	3.38E+04	0.	1.15E+04	1.93E+04	5.70E+07	1.78E+06
CE-141	2.91E+04	1.97E+04	0.	9.13E+03	0.	7.52E+07	2.23E+03
CE-144	2.15E+06	8.97E+05	0.	5.32E+05	0.	7.26E+08	1.15E+05

Based on 1 μCi/sec release rate of each isotope in and a value of 1. for X/Q, depleted X/Q and relative deposition Note - the units for C---14 and H----3 are (mrem/yr per μCi/cu. meter)

REVISION NO.:	PROCEDURE TITLE:				i	1	PAGE
50		OFFSI	E DOSE CALCI	JLATION MANU	AL (ODCM)		202 -6 221
PROCEDURE NO.:				·			
C-200		1	ST. LU	CIE PLANT			
······································					·····		
-				E G-20 ON EACTORS E			CES
<u> </u>		GOATS MILK (D FORAGE)			<u>525</u>
	· · · · · · · · · · · · · · · · · · ·	DRGAN DOSE E	ACTOR (SO	METER-MREM/		C)	
	_					-	
NUCLIDE	BÓNE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
H3	0.	1.99E+03	1.99E+03	1.99E+03	1.99E+03	1.99E+03	1.99E+03
C-14	3.63E+05	7.28E+04	7.28E+04	7.28E+04	7.28E+04	7.28E+04	7.28E+04
P32	2.05E+10	1.29E+09	0.	0.	0.	2.31E+09	7.94E+08
CR51	0.	0.	2.05E+03	7.58E+02	4.56E+03	8.64E+05	3.43E+03
MN54	0.	1.01E+06	0.	3.00E+05	0.	3.09E+06	1.93E+05
FE59	3.87E+05	9.18E+05	Ó.	0.	2.55E+05	3.03E+06	3.50E+05
CO57	0.	1.54E+05	0.	0.	0.	3.90E+06	2.55E+05
CO58	0.	5.67E+05	0.	0.	0.	1.15E+07	1.27E+06
CO60	0.	1.98E+06	0.	0.	0.	3.70E+07	4.34E+06
ZN65	1.65E+08	5.24E+08	0.	3.50E+08	0.	3.30E+08	2.37E+08
RB86	0.	3.12E+08	0.	0.	0.	6.15E+07	1.45E+08
SR89	3.06E+09	0.	0.	0.	0.	4.89E+08	8.76E+07
SR90	9.87E+10	0.	0.	0.	0.	1.32E+09	2.41E+10
Y91	1.03E+03	0.	0.	0.	0.	5.68E+05	2.77E+01
ZR95	3.82E+03	2.10E+03	0.	2.10E+03	0.	1.26E+07	8.34E+02
NB95	9.92E+03	5.51E+03	0.	5.46E+03	0.	3.34E+07	2.17E+03
RU-103	1.23E+02	Q.	0.	4.69E+02	0.	1.43E+04	5.30E+01
RU-106	2.45E+03	0.	0.	4.73E+03	0.	1.58E+05	3.10E+02
AG110	7.00E+06	6.48E+06	0.	1.27E+07	0.	2.64E+09	3.85E+06

Note - the units for C---14 and H----3 are (mrem/yr per μ Ci/cu. meter)

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REVISION NO .:	PROCEDURE TITLE:					i	PAGE
50		OFFSI7	LE DOSE CALC	ULATION MANU	JAL (ODCM)		204 of 221
PROCEDURE NO.:	7						
C-200		1	ST. LU	CIE PLANT			
		· · ·	TABL	.E G-20	i		
<u>E1</u>	VIRONMENTAL	<u>- PATHWAY-DO</u>	DSE CONVERS	ON FACTORS	R(I) FOR GASE	DUS DISCHAR	GES
	PATHWAY -	GOATS MILK (CONTAMINATE	D FORAGE)	AGE GRO	OUP - ADULT	
	O	RGAN DOSE F	ACTOR (SQ.	METER-MREM/	YR PER µCI/SE	C)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY
SN-123	0.	0.	0.	0.	0.	0.	0.
SN-126	1.97E+08	3.92E+06	1.15E+06	0.	5.61E+05	1.31E+08	5.92E+06
SB-124	3.10E+06	5.85E+04	7.49E+03	0.	2.40E+06	8.77E+07	1.22E+06
SB-125	3.16E+06	7.28E+04	3.58E+04	4.47E+05	3.19E+08	2.74E+07	6.29E+05
TE 125M	1.96E+06	7.10E+05	5.89E+05	7.95E+06	0.	7.81E+06	2.62E+05
TE 127M	5.57E+06	1.94E+06	1.47E+06	2.26E+07	0.	2.52E+07	6.86E+05
TE 129M	7.27E+06	2.72E+06	2.51E+06	3.04E+07	0.	3.65E+07	1.15E+06
I130	5.12E+05	1.52E+06	1.93E+08	2.36E+06	0.	1.30E+06	5.96E+05
I131	3.56E+08	5.10E+08	1.67E+11	8.72E+08	0.	1.34E+08	2.92E+08
I132	2.00E-01	5.36E-01	7.06E+01	8.55E-01	0.	1.01E-01	1.91E-01
I133	4.80E+06	8.32E+06	1.60E+09	1.45E+07	0.	7.32E+06	2.54E+06
I134	0.	0.	1.20E-09	0.	0.	0.	0.
I135	1.68E+04	4.44E+04	5.80E+06	7.05E+04	2.28E-01	4.97E+04	1.63E+04
CS-134	1.70E+10	4.04E+10	Ó.	1.31E+10	4.34E+09	7.06E+08	3.30E+10
CS-136	7.84E+08	3.09E+09	0.	1.72E+09	2.36E+08	3.52E+08	2.23E+09
CS-137	2.22E+10	3.03E+10	0.	1.03E+10	3.42E+09	5.83E+08	1.99E+10
BA-140	3.23E+06	4.05E+03	0.	1.38E+03	2.32E+03	6.84E+06	2.13E+05
CE-141	3.49E+03	2.36E+03	0.	1.10E+03	0.	9.02E+06	2.68E+02
CE-144	2.58E+05	1.08E+05	0.	6.39E+04	0.	8.71E+07	1.38E+04

Based on 1 μCi/sec release rate of each isotope in and a value of 1. for X/Q, depleted X/Q and relative deposition Note - the units for C---14 and H----3 are (mrem/yr þer μCi/cu. meter)

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50	I		OFFSI	TE DOSE CALC	ULATION MANL	JAL (ODCM)		005 -4 004
PROCEDURE N	0.:					. ,		
C-20	00			ST. LU	JCIE PLANT			
	<u></u>		_ <u></u>	÷	ii			
				TABL	.E G-21			,
	<u>EN'</u>	VIRONMENTAL	<u>- PATHWAY-DO</u>	DSE CONVERS	ION FACTORS I	R(I) FOR GASE	<u> DUS DISCHARC</u>	<u>SES</u>
		PATHWA	Y - MEAT (CO	NTAMINATED F	ORAGE)		> - ADULT	
		0	RGAN DOSE F	ACTOR (SQ.	METER-MREM/	YR PER μCI/SE	.C)	
				TUNDOID				
		BONE						WHULE BODY
H	-3	0.	4.13E+02	4.13E+02	4.13E+02	4.13⊢+02	4.13±+02	4.13E+02
C-1	4	3.33E+05	6.67E+04	6.67E+04	6.67E+04	6.67E+04	6.67E+04	6.67E+04
P;	32	4.67E+09	2.93E+08	0.	0.	0.	5.25E+08	1.81E+08
CR	-51	0.	0.	4.23E+03	1.56E+03	9.38E+03	1.78E+06	7.07E+03
MN	-54	0.	9.18E+06	0.	2.73E+06	0.	2.81E+07	1.75E+06
FE	.59	2.67E+08	6.33E+08	0.	0.	1.76E+08	2.09E+09	2.41E+08
CO	-57	0.	5.64E+06	0.	0.	0.	1.43E+08	9.38E+06
CO	-58	0.	1.83E+07	Q.	0.	0.	3.70E+08	4.09E+07
CO	-60	0.	7.55E+07	Ó.	0.	0.	1.41E+09	1.66E+08
ZN	-65	3.56E+08	1.13E+09	0.	7.57E+08	0.	7.13E+08	5.12E+08
RB	-86	0,	4.89E+08	0.	0.	0.	9.64E+07	2.28E+08
SR	-89	3.03E+08	0.	0.	0.	0.	4.84E+07	8.67E+06
SR	-90	1.25E+10	0.	Ó.	0.	0.	1.45E+09	3.05E+09
Y?	91	1.14E+06	0.	0.	0.	0.	6.26E+08	3.05E+04
ZR	.95	3.78E+06	1.67E+06	0.	2.01E+06	0.	8.30E+09	8.26E+05
NB	.95	2.30E+06	1.28E+06	0.	1.27E+06	0.	7.75E+09	5.02E+05
RU-1	103	1.06E+08	0.	0.	4.06E+08	0.	1.24E+10	4.59E+07
RU-1	106	2.80E+09	0.	0.	5.41E+09	0.	1.81E+11	3.54E+08
AG1	10	6.71E+06	6.21E+06	0.	1.22E+07	0.	2.53E+09	3.69E+06

Based on 1 μCi/sec release rate of each isotope in and a value of 1. for X/Q, depleted X/Q and relative deposition Note - the units for C---14 and H----3 are (mrem/yr per μCi/cu. meter)

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PROCEDURE NO .:												
C-200		ST. LUCIE PLANT										
				i a a a								
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			JSE CUNVERS	ORACE)			<u>3E3</u>					
	CALLING C	RGAN DOSE E	ACTOR (SO	METER_MREM/								
	C				παι εις μοιγρε	0)						
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY					
SN-123	0.	0.	0.	0.	0.	0.	0.					
SN-126	1.86E+10	3.69E+08	1.08E+08	0.	6.46Ė+06	6.19E+09	5.33E+08					
SB-124	1.99E+07	3.75E+05	4.80E+04	0.	1.54E+07	5.62E+08	7.85E+06					
SB-125	6.65E+07	1.58E+07	1.29E+07	1.74E+08	2.49E+09	3.80E+08	1.05E+07					
TE 125M	3.59E+08	1.30E+08	1.08E+08	1.46E+09	0.	1.43E+09	4.81E+07					
TE 127M	1.13E+09	3.93E+08	2.96E+08	4.56E+09	0.	5.11E+09	1.39E+08					
TE 129M	1.14E+09	4.29E+08	3.95E+08	4.79E+09	0.	5.76E+09	1.82E+08					
I130	2.38E-06	7.05E-06	8.96E-04	1.10E ₇ 05	0.	6.04E-06	2.77E-06					
I131	1.08E+07	1.55E+07	5.06E+09	2.65E+07	0.	4.07E+06	8.85E+06					
I132	0.	0.	Ó.	0.	0.	0.	Q.					
I133	4.40E-01	7.63E-01	1.47E+02	1.33E+00	0.	6.71E-01	2.33E-01					
I134	0.	0.	0.	0.	0.	0.	0.					
I135	8.60E-02	7.94E-02	0.	3.01E-02	9.04E-03	1.86E-03	3.53E-02					
CS-134	6.58E+08	1.57E+09	0.	5.08E+08	1.68E+08	2.74E+07	1.28E+09					
CS-136	1.18E+07	4.67E+07	0.	2.60E+07	3.56E+06	5.31E+06	3.36E+07					
CS-137	8.73E+08	1.19E+09	0.	4.06E+08	1.35E+08	2.30E+07	7.82E+08					
BA-140	2.88E+07	3.63E+04	0.	1.23E+04	2.07E+04	6.87E+07	1.90E+06					
CE-141	1.41E+04	9.52E+03	0.	4.41E+03	0.	3.63E+07	1.08E+03					
CE-144	1.46E+06	6.10E+05	0.	3.62E+05	0.	4.93E+08	7.83E+04					

Based on 1 μCi/sec release rate of each isotope in and a value of 1. for X/Q, depleted X/Q and relative deposition Note - the units for C---14 and H----3 are (mrem/yr per μCi/cu. meter)

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50		OFFSI	TE DOSE CALC	ULATION MANU	AL. (ODCM)		207 of 231						
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C-200		ST. LUCIE PLANT											
				E C 22									
FI				E G-22		OUS DISCHAR	2F6						
<u>14</u>	PATHWA	Y - FRESH FRU	JITS AND VEGE	TABLES	AGE GROUI	P - ADULT							
	C	RGAN DOSE F	ACTOR (SQ.	METER-MREM/	YR PER uCI/SE	.C)							
	-					0)							
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	WHOLE BODY						
H3	0.	4.02E+02	4.02E+02	4.02E+02	4.02E+02	4.02E+02	4.02E+02						
C-14	1.25E+05	2.50E+04	2.50E+04	2.50E+04	2.50Ė+04	2.50E+04	2.50E+04						
P32	1.04E+09	6.51E+07	0.	0.	0.	1.17E+08	4.02E+07						
CR51	Ó.	0.	1.15E+04	4.25E+03	2.56E+04	4:85E+06	1.93E+04						
MN54	0.	4.87E+07	0.	1.45E+07	0.	1.49E+08	9.31E+06						
FE59	3.64E+07	8.64E+07	0.	0.	2.40E+07	2.85E+08	3.29E+07						
CO57	0.	1.85E+06	0.	0.	0.	4.70E+07	3.08E+06						
CO58	0.	6.89E+06	0.	0.	0.	1.40E+08	1.54E+07						
CO60	0	2.38E+07	0.	0.	0.	4.46E+08	5.23E+07						
ZN65	5.11E+07	1.62E+08	0.	1.09E+08	0.	1.02E+08	7.34E+07						
RB86	0.	1.30E+08	0.	0.	0.	2.56E+07	6.06E+07						
SR89	2.67E+09	0.	0.	0.	0.	4.26E+08	7.64E+07						
SR90	8.49E+10	Ó.	0:	0.	0.	2.14E+09	2.07E+10						
Y91	1.26E+06	0.	0.	0.	0.	6.92E+08	3.37E+04						
ZR95	2.93E+05	9.82E+04	D.	1.49E+05	0.	3.34E+08	6.38E+04						
NB95	4.87E+04	2.71E+04	0.	2.68E+04	0.	1,64E+08	1.06E+04						
RU-103	1.50E+06	0.	 .	5.75E+06	0.	1.76E+08	6.49E+05						
RU-106	2.95E+07	0.	Ó.	5.71E+07	0.	1.91E+09	3.74E+06						
AG110	1.69E+06	1.56E+06	Ö .	3.08E+06	0.	6.38E+08	9.30E+05						

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Based on 1 μ Ci/sec release rate of each isotope ih and a value of 1. for X/Q, depleted X/Q and relative deposition

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50		OFFSI	TE DOSE CALC	ULATION MANU	AL (ODCM)		208 of 231
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C-200		i	ST. LU	ICIE PLANT			
EN		_ PATHWAY-DO	TABL	E G-22 ION FACTORS F			GES
	PATHWA	Y - FRESH FRU	JITS AND VEGE	TABLES	AGE GROU	P - ADULT	
	C	RGAN DOSE F	ACTOR (SQ.	METER-MREM/	YR PER µCI/SE	C)	
NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	ĢI-ĻLI	WHOLE BODY
SN-123	1.00E-05	1.66E-07	1.41E-07	0.	0.	2.04E-05	2.45E-07
SN-126	9.52E+08	1.89E+07	5.54E+06	0.	4.31E+06	8.46E+08	2.94E+07
SB-124	2.52E+07	4.75E+05	6.08E+04	0.	1.95€+07	7.12E+08	9.94E+06
SB-125	2.58E+07	7.23E+05	4.03E+05	5.14E+06	2.56Ė+09	2.22E+08	5.10E+06
TE 125M	2.38E+07	8.65E+06	7.17E+06	9.69E+07	0.	9.51E+07	3.19E+06
TE 127M	6.75E+07	2.36E+07	1.77E+07	2.73E+08	0.	3.06E+08	8.32E+06
TE 129M	8.93E+07	3.34E+07	3.08E+07	3.73E+08	0.	4.49E+08	1.42E+07
I130	3.93E+05	1.16E+06	1.48E+08	1.81E+06	0.	9.98E+05	4.58E+05
I131	7.78E+07	1.12E+08	3.65E+10	1.91E+08	0.	2.94E+07	6.38E+07
I132	5.57E+01	1.49E+02	1.96E+04	2.38E+02	0.	2.80E+01	5.29E+01
I133	2.13E+06	3.69E+06	7.10E+08	6.44E+06	0.	3.24E+06	1.13E+06
I134	1.03E-04	2.79E-04	3.63E-02	4.45E-04	0.	2.43E-07	9.99E-05
I135	4.04E+04	1.07E+05	1.40E+07	1.70E+05	8.65E-03	1.19E+05	3.91E+04
CS-134	6.82E+08	1.62E+09	0,	5.26E+08	1.74E+08	2.84E+07	1.33E+09
CS-136	3.32E+07	1.31E+08	0.	7.29E+07	9.99E+06	1.49E+07	9.43E+07
CS-137	8.90E+08	1.22E+09	0.	4.14E+08	1.37E+08	2.34E+07	7.98E+08
BA-140	1.03E+08	1.35E+05	0.	4.39E+04	7.38E+04	6.65E+08	6.77E+06
CE-141	7.16E+04	4.85E+04	0.	2.25E+04	0.	1.85E+08	5.49E+03
CE-144	5.19E+06	2.17E+06	0.	1.29E+06	0.	1.75E+09	2.78E+05

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50	OFFSITE DOSE CALCU	LATION MANUAL (
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C-200	ST. LUC	CIE PLANT	
	TABE	E M-1	
Selecting the Appro	oriate Long ∓erm (X/Q) for	Dose Calculations I	nvolving Noble Gases
(1) Total-Body (lose from instantaneous re	eleases	
(2) Skin dose fr	om instantaneous release	s	
(3) [°] Gamma air	dose (cumulative)		
(4) ⁻ Beta air dos	e (cumulative)		
TYPE OF DOS CALCULATION	E LIMITING RANGE	LIMITING Sector	(X/Q) VALUE sec/m ³
Instantaneous	0.97	NW	1.6 X 10 ⁻⁶
1/31 days	0.97	-	
Quarterly Yearly	0.97	1. Normally (X/Q) =	1.6 X 10 ^{°°} sec/m [°]
	9 0.97	data for time of c	oncern.
12 Consecutive months	0.01		

The (X/Q) has to be calculated based on actual meteorological data_that occurred during the period of interest. The sector of interest is N/A because the limiting (X/Q) will be determined from the actual meteorological data and may occur in any sector.

Corresponds to the minimum site boundary distance in the north direction -0.97 miles and 0.97 miles was chosen for all other sectors for ease of calculations whenthe averaging is done for quarterly reports.

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50	50 OFFSITE DOSE CALCULATION MANUAL (ODCM) 210 of 231											
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-C - 200 _	-C-200 _ ST. LUCIE PLANT											
		TABLE M-2										
Selecting the Appro	priate Long Term	(X/Q) _D or (D/Q) for Do	ose									
Calculations Involvir	ng Radioiodines &	8 D Particulates for:										
(1) Inhalation												
(2) Tritium (All (gas pathways)											
(3) Ground Plai	ne			-								
TYPE OF DOSE CALCULATION	LIMITING RANGE (miles)	LIMITING SECTOR (OL)	(X/Q) _D sec/m ³	(D/Q) 1/m ²								
Instantaneous	0.97	NW	B 1.3 X 10 ⁻⁶									
		WNW		8.2 X 10 ⁻⁹								
	0.97	-A_	A, B									
Annual Repoπ	0.97	А		A								
1/31 days, Qtr. yearly,	0.97	NW	B 1.3 X 10⁻⁵									
Annual Total Dose	0.97	WNW		8.2 X 10 ⁻⁹								

(OL) Over land areas only

(A) To be determined by reduction of actual met data occurring during each quarter

(B) For Tritium in the Milk Animal Pathway, the (X/Q)_D value should be that of the respective controlling sector and range where the Milk Animal is located as per Table M-3. Example: If a cow was located at 4.25 miles in NW sector, use the (X/Q)_D for 4.25 miles NW.

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C-200	ST. LUCIE PLANT		

TABLE M-3

Selecting the Appropriate Long Term (D/Q) for Dose Calculations Involving Radioiodines and 8D Particulates for Grass-Cow-Milk or Grass-Goat-Milk:

TYPE OF DOSE CALCULATION	LIMITING TRANGE	LIMITING SECTOR	(D/Q) Value 1/m ²
Release Rate	A,	A-	A
1/31 Days	В	В	В
Quarterly - Yearly	В	В.	B-
Annual (Calendar Year)	- B	В	В
Annual Report	C.	С	С

A. The worst cow or goat as per locations from land census. If no milk animal in any sector, assume a cow at 4.25 miles in the highest (D/Q) sector over land.

B. The historical (D/Q) of all land sectors with the worst cow or goat from each sector as reported in the Land Census. A 4.25 mile cow should be assumed in the worst sector over land when no milk animal is reported.

C. The highest (D/Q) at a milk animal location of all milk animals reported in the Land Census Report. (If no milk animals within 5 miles a 4.25 mile cow should be assumed in the sector having the highest (D/Q) at 4.25 miles over land). Actual Met Data should be used for the selection of the worst case milk animal and for the dose calculations. If both goat and milk animals are reported inside 5 miles, dose calculations should be performed on each animal-and the higher dose animal _contribution should be used.

The historical wind frequency fractions for each sector are listed in Table M-8.

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50		OFFSITE DOSE CALULATION MANUAL (ODCM)										
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C-200		ST. LUCIE PLANT										
I	· · · ·			т.		<u></u> ⊹	I		-			
			TERF		RRECTIC	N FACT	<u>OR\$</u>					
Florida Power	& Light Compa	nv										
St. Lucie Unit 1	a Eigin oompa 1	in y			Terra	in Correċ	tion Facto	ors (PUFF	- / STRAI	GHT I INI	=)	
Hutchinson Isla	and. Florida				Perio	d of Reco	ord: 8/29/	77 to 8/3	1/78		-,	
Dames and Mo	ore Job No: 4	598 - 112	2		Base	Distance	in Miles/	Kilometer	S			
			-						-			
	DESIGN	1										
AFFECTED	DISTANCE	.25	.75	1.25	1.75	2.25	2.75	3.25	3.75	4.25	4.75	
SECTOR	MILES	.40	1.21	2.01	2.82	3.62	4.42	5.23	6.03	6.84	7.64	
NNE	0.	1.906	1.576	1.465	1.404	1.338	1.318	1.334	1.386	1.346	1.338	
NE	0.	1.887	1.581	1.461	1.391	1.310	1.259	1.164	1.128	1.101	1.116	
ENE	0.	1.452	1.230	1.122	1.081	1.047	1.033	.941	.941	.906	.902	
E	0,	1.662	1.425	1.277	1.193	1.151	1.123	1.097	1.121	1.123	1.122	
ESE	0.	1.690	1.483	1.328	1.260	1.246	1.190	1.134	1.094	1.032	.968	
SE	0.	1.818	1.691	1.470	1.427	1.435	1.361	1.366	1.331	1.279	1.239	
SSE	0.	1.812	1.586	1.370	1.302	1.270	1.263	1.229	1.193	1.171	1.151	
S	0.	1.398	1.321	1.125	1.083	1.108	1.127	1.073	1.063	1.047	1.024	
SSW	0.	1.534	1.411	1.296	1.192	1.205	1.132	1.135	1.116	1.077	1.060	
SW	0.	1.685	1.492	1.294	1.233	1.200	1.222	1.160	1.160	1.198	1.196	
WSW	0.	1.620	1.333	1.210	1.173	1.082	1.091	1.099	1.056	1.034	1.004	
W	0.	1.651	1.415	1.290	1.218	1.154	1.099	1.081	1.067	1.093	1.083	
WNW	0.	1.720	1.430	1.267	1.185	1.150	1.133	1.125	1.085	1.033	1.045	
	0	1.681	1.407	1.257	1.173	1.119	1.078	1.063	.995	.998	.978	
NW	U.		1		1 0 1 0	4 4 70	1 1 2 2	1 1 25	1 000	1 000	4 004	
NW NNW	Q.	1.739	1.488	1.316	1.212	1.172	1.122	1.139	1.000	1.099	1.091	

Note 1: Any interpolations between stated mileages will be done by log-log

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SIÓN NŌ.:	PROCEDURE	TTLE:		ï				-		PAC	GE:
50 CEDURE NO.:	_		OFFŞI	TE DOSE	CALULAT	ION MAN	UAL (ODÇ	M)			213 of 23
C-200				S	T. LUCIE	PLANT			,		
		HIS		. LONG TE	TABLE M ERM - (X/C	-5 <u>2) (Freque</u>	encv corre	cted)			
	Τe	errain / Red	circulation	Adjusted	Prog	ram ANNX	OQ9 Ver	sion - 11/1	8/76		
Florida Pow St. Lucie U Hutchinson Dames and	ver & Light Co nit 1 Island, Floric I Moore Job N	ompåny la lo: 1.4598	8 - 112		Aver Perio Base	rage Annu od of Reco e Distance	al Relative ord: 9/1/76 in Miles/K	Concentr 5 to 8/31/78 (ilpmeters	ation (sec/ 8	cubic met	er)
AFFECTED SECTOR	DESIGN DISTANCE MILES	.25 .40	.75 1.21	1.25 2.01	1.75 2.82	2.25 3.62	2.75 4.42	3.25 5.23	3.75 6.03	4.25 6.84	4.75 7.64
NNE	0.	1.1E-05	1.7E-06	7.8E-07	4.5E-07	3.1E-07	2.2E-07	1.7E-07	1.5E-07	1.2E-07	1.0E-07
NE	0.	1.3E-05	2.1E-06	8.9E-07	5.1E-07	3.4E-07	2.4E-07	1.7E-07	1.4E-07	1.1E-07	9.8E-08
ENE	0.	9.3E-06	1.4E-06	6.2E-07	3.7E-07	2.5E-07	1.9E-07	1.3E-07	1.1E-07	8.8E-08	7.5E-08
E	0.	9.8E-06	1.6E-06	6.5E-07	3.7E-07	2.5E-07	1.8E-07	1.4E-07	1.2E-07	9.9E-08	8.4E-08
ESE	0.	1.2E-05	1.9E-06	8.1E-07	4.8E-07	3.2E-07	2.4E-07	1.8E-07	1.4E-07	1.1E-07	9.0E-08
SE	0.	1!4E-05	2.4E-06	9.7E-07	5.7E-07	4.0E-07	2.9E-07	2.3E-07	1.9E-07	1.4E-07	1.2E-07
SSE	0.	1.1E-05	1.7E-06	7.3E-07	4.3E-07	2.9E-07	2.1E-07	1.6E-07	1.3E-07	1.1E-07	9.1E-08
S	0.	6.2E-06	1.0E-06	4.2E-07	2.5E-07	1.8E-07	1.4Ę-07	1.0E-07	8.0E-08	6.6E-08	5.5E-08
SSW	0.	5.7E-06	9.0E-07	4.0E-07	2.3E-07	1.6E-07	1.1É-07	8.9E-08	7.0E-08	5.7E-08	4.8E-08
SW	0.	6.1E-06	9.4E-07	3.9E-07	2.2E-07	1.6E-07	1.1E-07	8.6E-08	7.0E-08	6.0E-08	5.1E-08
WSW	0.	7.3E-06	1.1E-06	4.6E-07	2.7E-07	1.7E-07	1.3E-07	1.0E-07	8.0E-08	6.5E+08	5.4E-08
W	0.	7.6E-06	1.2E-06	5.2E-07	2.9E-07	2.0E-07	1.3E-07	1.0E-07	8.4E-08	7.2E-08	6.1E-08
WNW	0.	1.4E-05	2.1E-06	9.1E-07	5.2E-07	3.4E-07	2.6E-07	2.0E-07	1.5E-07	1.2E-07	1.0E-07
NW	0.	1.6E-05	2.4É-06	1.0E-06	5.9E-07	3.9E-07	2.8E-07	2.1E-07	1.7E-07	1.4E-07	1.2E-07
	0.	1.5E-05	2.2E-06	9.6E-07	5.5E-07	3.6E-07	2.6E-07	2.0E-07	1.6E-07	1.3E-07	1.2E-07
NNW											

Number of Valid Observations = 17135 Number of Invalid Observations = 385Number of Calms UppNote 1 - Any interpolations between stated mileages will be done by log-log

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Number of Calms Lower Level = 95 Number of Calms Upper Level = 0

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50			OFFSI	TE DOSE	CALULAT	ION MAN	JAL (ODC	M)			214 of 231
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C-200			· · · · · · · · · · · · · · · · · · ·								
		1		î		-6		<u></u>			
		HISTORIC	AL LONG	TERM D	EPLETED	<u>- (X/Q)_D (I</u>	Frequency	<u>y correcte</u>	<u>ed)</u>		
	Te	errain / Re	circulation	Adjusted	Prog	ram ANNX	OQ9 Ver	sion - 11/1	8/76		
Florida Po	wer & Light Co	mnanv		-	_		,				
St Lucio I	linit 1	Sinpany		1		nual Rala	tive Conce	ntration D	onlated (s	oc/cubic m	notor)
	uniciand Eloria						1/76 to 8/3	1/78	epiered (s		
Domos or	n Island, Fiond	10. 1500	110	r c		ecoru. 9/ noo in Mila	1//0 l0 0/3	1//0			
Dames an		10. 4590 -	112	E	Dase Dista		siniomea	515			
AFFFOTED	DESIGN	1			T						
SECTOR	DISTANCE	.25	.75	1.25	1.75	2.25	2.75	3.25	3.75	4.25	4.75
	MILES	40	1.21	2.01	2.82	3.62	4.42	5.23	6.03	6.84	7.64
NNE	0	1.1E-05	1.6E-06	6.6E-07	3.8E-07	2.4E-07	1.7E-07	1.3E-07	1.1E-07	9.2E-08	7.6E-08
NE	0.	1.2E-05	1.7E-06	7.6E-07	4.3E-07	2.8E-07	1.9E-07	1.4E-07	1.1E-07	8.6E-08	7.4E-08
ENE	0.	8.9E-06	1.2E-06	5.3E-07	3.0E-07	2.0E-07	1.4E-07	1.0E-07	8.4E-08	6.6E-08	5.6E-08
E	0.	9.1E-06	1.3E-06	5.6E-07	3.1E-07	2.1E-07	1.5E-07	1.1E-07	9.1E-08	7.5E-08	6.3E-08
ESE	0.	1.2E-05	1.6E-06	6,9E-07	3.9E-07	2.6E-07	1.9E-07	1.4E-07	1.1E-07	8.5E-08	6.7E-08
SE	0.	1.3E-05	2.0E-06	8.2E-07	4.7E-07	3.3E-07	2.3E-07	1.8E-07	1.3E-07	1.1E-07	9.0E-08
SSE	ρ.	1.1E-05	1.6E-06	6.3E-07	3.5E-07	2.4E-07	1.8E-07	1.4E-07	1.0E-07	8.2E-08	6.8E-08
S	0.	5.9E-06	9.1E-07	3.6E-07	2.1E-07	1.4E-07	1.1E-07	7.7E-08	6.2E-08	5.0E-08	4.1E-08
SSW	0.	5.4E-06	8.0E-07	3.4E-07	1.9E-07	1.3E-07	8.9E _† 08	6.9E-08	5,5E-08	4.3E-08	3.6E-08
SW	0.	5.7E-06	8.4E-07	3.4E-07	1.8E-07	1.2E-07	9.2E-08	6.7E-08	5.3E-08	4.6E-08	3.8E-08
WSW	0.	7.0E-06	9.6E-07	4.0E-07	2.2E-07	1.4E-07	1.0E-07	8.0E-08	6.1E-08	5.0E-08	4.0E-08
W	0.	7.3E-06	1.1E-06	4.4E-07	2.4E-07	1.6E-07	1.1E-07	8.2E-08	6.4E+08	5.5E-08	4.4E-08
WNW	0.	1.3E-05	1.9E-06	7.9E-07	4.4E-07	2.9E-07	2.0Ę-07	1.6E-07	1.2E-07	9.3E-08	7.8E-08
NW	0.	1.5E-05	2.1E-06	8.9E-07	4.9E-07	3.1E-07	2.3E-07	1.7E-07	1.3E-07	1.0E-07	8.5E-08
NNW	0.	1.4E-05	2.1E-06	8.3E-07	4.5E-07	2.9E-07	2.0E-07	1.6E-07	1.2E-07	1.0E-07	8.6E-08
N	0.	8.7E-06	1.3E-06	5.4E-07	3.0E-07	2.0E-07	1.4E-07	1.1E-07	8.9E-08	7.0E-08	5.8E-08
		· · · · · · · ·	4	·	L	· · ·	<u>└</u> ,	·	<u> </u>	I	·

Number of Valid Observations = 17135 Number of Invalid Observations = 385Number of Calms Upper Level = 0Note 1 - Any interpolations between stated mileages will be done by log-log

Number of Calms Lower Level = 95

/ISION NO.:	PROCEDURE T	ITLE:		,				į i		PAC	e:	
50	_	OFFSITE DOSE CALULATION MANUAL (ODCM)										
DCEDURE NO.:												
C-200				S	T. LUCIE	PLANT		<u>-</u>				
				, ï		_7						
		HIS		LONG TE	<u>ERM - (D/0</u>	2) (Freque	ency corre	ected)				
	TERRAIN	/ RECIRC	ULATION	ADJUSTE	D PF	ROGRAM	ANNXOQ	9 VERSIC	DN - 11/18	/76		
Florida Pov	ver & Liaht Co	ompany					I					
St. Lucie U	nit 1	···· / · ···· /			Ave	rage Annu	al Relative	Depositio	on Rate (so	uare mete	er - 1)	
Hutchinson	Island, Florid	la			Peri	od of Reco	ord: 9/1/76	6 to 8/31/7	8	1	/	
Dames and	Moore Job N	lo: 4598 -	112		Base	e Distance	in Miles/K	Cilometers				
						·						
AFFECTED	DESIGN											
SECTOR		.25	.75	1.25	1.75	2.25	2.75	3.25	3.75	4.25	4.75	
NNE		6.5E-08	9.3E-09	3.7E-09	2.02 2.1E-09	<u> </u>	9.0E-10	6.8E-10	5.03 5.5E-10	4.3E-10	7.04 3.5E-10	
NF	0.	6.0E-08	8.9E-09	3.5E-09	1.9F-09	1.0E-00	8 1 E-10	5.6E-10	4 3E-10	3.3E-10	2 8E-10	
ENE	0.	3.2E-08	4.8E-09	1.9E-09	1.0E-09	6.6E-10	4.6E-10	3.2E-10	2.4E-10	1.9E-10	1.5E-10	
E	0.	3.0E-08	4.6E-09	1.8E-09	9.5E-10	6.0E-10	4.2E-10	3.1E-10	2.5E-10	2.0E-10	1.6E-10	
ESE	Ó.	3.7E-08	5.8E+09	2.3E-09	1.2E-09	8.0E-10	5.4E-10	3.9E-10	3.0E-10	2.2E-10	1.7E-10	
SE	0.	6.4E-08	1.0E-08	4.0E-09	2.1E-09	1.4E-09	9.7E-10	7.2E-10	5.6E-10	4.3E-10	3.5E-10	
SSE	0.	6.2E-08	9.5E-09	3.6E-09	2.0E-09	1.2E-09	8.7E-10	6.4E-10	4.9E-10	3.9E-10	3.1E-10	
S	0.	4.2E-08	7.0E-09	2.6E-09	1.4E-09	9.5E-10	6.9E-10	4.9E-10	3.8Ė-10	3.0E-10	2.5E-10	
SSW	0.	3.4E-08	5.4E-09	2.2E-09	1.1E-09	7.5E-10	5.0E-10	3.7E-10	2.9E-10	2.3E-10	1.8E-10	
SW	0.	4.5E-08	7.0E-09	2.6E-09	1.5E-09	9.0E-10	6.6E-10	4.6E-10	3.6E-10	3.0E-10	2.5E-10	
WSW	0.	5.3E-08	7.7E-09	3.0E-09	1.6E-09	1.0E-09	7.3E-10	5.5E-10	4.1E-10	8.3E-10	2.6E-10	
W	0.	5.0E-08	7.5E-09	3.0E-09	1.6E-09	9.8E-10	6.7E-10	5.0E-10	3.8E-10	3.2E-10	2.6E-10	
WNW	0.	8.8E-08	1.3E-08	4.9E-09	2.6E-09	1.7E-09	1.1E-09	8.7Ė-10	6.6E-10	5.1E-10	4.2E-10	
	0.	8.2E-08	1.2E-08	4.7E-09	2.5E-09	1.6E+09	1.1E-09	7.9E-10	5.8E-10	4.7E-10	3.8E-10	
NW				4.05.00	2 1 = 00	1 55 00	1 1 ±_00	8 1E-10	5.9E-10	4 8E-10	4 0E-10	
NW NNW	0.	8.2E-08	1.2E-08	4.6E-09	2.40-09	1.00-09	1.12-05	0.10	0.0 - 10			

Note 1 - Any interpolations between stated mileages will be done by log-log

REVISION NO .:		PROCEDURE	TITLE:		PROCEDURE TITLE:				
50		OFFSITE DOSE CALCULATION MANUAL (ODCM)						1001	
ROCEDURE NO).:					•	· 21	6 OT 231	
C-200		ST. LUCIE PLANT							
								la dhi	
				TABLE M	-8		NQ.		
oint Wind Fr	requency	Distributio	n E	Data Period	: Septemb	er 1, 1976 ·	- August 31	, 1978	
ll Winds				St.	Lucie Unit 2	2			
ata Source:	On-Site	Hutchinson Island, Florida							
ind Sensor	Height	10.00 Mete	rs	Flor	ida Power	& Light Co.		40 07	
able Genera	ated: 172/	05/78.07.4	12.18.	Dar	nes and Mo	ore Job No	0: 4598 - 1	12 - 27	
		Wind	Speed Ca	tegories (M	eters per S	econd)		1	
WIND	0.0-	1.5-	3.0-	5.0-	7.5-	>10.0	TOTAL ¹	MEAN	
<u>SECTOR</u>	1.5 71	206	 ວ.∪ ຈ1⊋	7.5	<u> </u>	Θ	-669	SPEED	
NNE	.43	1.25	1-92	.43	.02	0.00	4.05	3.32	
NE	62	292	385	128	- 0	0	867	3.43-	
	.38	1.77	2.33	.77	0.00	0.00	5.25		
ENE	60	334	505	- 158	0	0-	1057	3.51	
E	.35	2.02	3.06	.96	0.00	0.00	6.40	3.25	
	42	2 15	3.09	46	0.00	0 00	6 11		
ESE	115	684	744	72	1	- 0-	1616	3.04	
	.70	4.14	4.50	.44	.01	0.00	9.78		
SE	183	660	749	28	0	0	1620	2.88	
	1.11	3.99	4.53	.17	0.00	0.00	9.81		
SSE	129	5/9	555	93			1458	3.10	
S	72	310	407	99	.01	1	897		
	.44	1.88	2.46	.60	.05	.01	5.43	3.36	
SSW SW	84	372	446	105	.33	4	1044	- 3.48 3.10	
	.51	2.25	2.70	.64	.20	.02	6.32		
	129 78	440	336	106	14		1025		
wsw	155	320	186	29	5	0.00	695	2.59	
	.94	1.94	1.13	.18	.03	0.00	4.21		
W	174	267	119	37	2	. 0	599	2.43	
	1.05	1.62	.72	.22 -	.01	0.00	3.63		
WNW	- 203 1.22	304	172				696	- 2.34	
NW	143	518	1.04	50	0.00	0.00	4.21	2.85	
	.87	- 3.14	2.57	.30-	0.00	0.00	6.87		
NNW	85	379	535	70 .	1	0	- 1070	3.22	
	.51	2.29 _	3.24	.42	.01	0.00	6.46		
N CALM	91	194	531	148	5		969	3.69	
	.55	<u> </u>	3.21	.90	.03	0.00	5.86		
	ษอ 57						90 57	CALM	
	1920	6214	7023	1287	73	5	16522	-	
TOTAL	11.62	37.61	42.51	7.79	.44	.03	100.00	3.10	

NUMBER OF VALID OBSERVATIONS1652294.30 PCT.NUMBER OF INVALID OBSERVATIONS9885.70 PCT.TOTAL NUMBER OF OBSERVATIONS17520100.00 PCT.

XXX Number of Occurrenc XXX Percent Occurrences

¹ - Totals below are given in <u>hours</u> & percent for wind frequency by sectors

END OF APPENDIX A
REVIS	ION NO.: 50	ROCEDURE TITL	OFFSITE DOSE CALCULATION	ON MANUAL	(ODCM)	· · ·	PAGE
PROC	EDURE NO.:						217 01 231
	C-200		ST. LUCIE PL	ANT	· · · · ·		
			RADIOLOGICAL ENVIRONMEN	<u>IAL SURVEII</u>	LANCE		
			(rage ror 4))			
			ST. LUCIE PLA	NT			
			Key to Sample Loo	cations			
	PATHWAY	LOCATION	DESCRIPTION	SAMPLES COLLECTED	SAMPLE COLLECTION FREQUENCY	APPROXIMATE DISTANCE (miles)	DIRECTION SECTOR
	Direct Radiation	N-1	North of Blind Creek	TLD	Quarterly	1	N
	Direct Radiation	NNW-5	Frederick Douglas Beach Entrance	TLD	Quarterly	4.8	NNW
	Direct Radiation	NNW-10	Coast Guard Station	TLD	Quarterly	8.7	NNW
	Direct Radiation	NW-5	Indian River Drive at Rio Vista Drive	TLD	Quarterly	5.4	NW
	Direct Radiation	NW-10	Intersection of SR 68 and 33rd St	TLD	Quarterly	9.6	NW
	Direct Radiation	WNW-2	Cemetery South of 7107 Indian River Drive	TLD	Quarterly	2.3	ŴNW
	Direct Radiation	WNW-5	US-1 at SR 712	TLD	Quarterly	5.1	WNW
	Direct Radiation	WNW-10	SR 70, Just West of I-95	TLĎ	Quarterly	10	WNW
	Direct Radiation	W-2	Power Line - 77609 Indian River Drive	TLD	Quarterly	2	W
	Direct Radiation	W-5	Oleander and Sager Streets	TLD	Quarterly	5.4	W
	Direct Radiation	W-10	I-95 and SR 709	TLD	Quarterly	10.3	Ŵ
	Direct Radiation	WSW-2	8503 Indian River Drive	TLĎ	Quarterly	1.8	WSW
	Direct Radiation	WSW-5	Prima Vista Blvd. at Yacht Club	TLD	Quarterly	5.6	WSW
	Direct Radiation	WSW-10	Del Rio and Davis Streets	TLD	Quarterly	10	WŚW
	Direct Radiation	SW-2	9205 Indian River Drive	TLD	Quarterly	2	SW
	Direct Radiation	SW-5	FPL Walton Svc Ctr	TLD	Quarterly	4.5	SW
	Direct Radiation	SW-10	Port St. Lucie Blvd. and Cairo Road	TLD	Quarterly	10.2	SW
	Direct Radiation	SSW-2	10307 Indian River Drive	, TLD	Quarterly	2.6	SSW
				· · · · · · · ·	·	· · ·	

EVISION NO.:	PROCEDURE TIT				· · · · · ·	PAGE:
50 ROCEDURE NO.:		OFFSITE DOSE CALCULATION	ON MANUAL	(ODCM)		218 of 231
C-200		ST. LUCIE P	LANȚ			
		APPENDIX I RADIOLOGICAL ENVIRONMEN (Page 2 of 4	B TAL SURVEIL)	LANCE		
		ST. LUCIE PLA Key to Sample Loo	ANT cations			
PATHWAY	LOCATION	DESCRIPTION	SAMPLES COLLECTED	SAMPLE COLLECTION FREQUENCY	APPROXIMATE DISTANCE (miles)	DIRECTION SECTOR
Direct Radiation	SSW-5	Port St. Lucie Blvd. and US 1	TLD	Quarterly	6	SSW
Direct Radiation	SSW-10	Pine Valley and Westmoreland Roads	TLD	Quarterly	8	SSW
Direct Radiation	S-5	13189 Indian River Drive	TLD	Quarterly	5.2	Ŝ
Direct Radiation	S-10	US 1 and Palm City Ave	TLD	Quarterly	10.8	S
Direct Radiation	S/SSE-10	Indian River Drive and Quail Run Lane	TLD	Quarterly	9.9	SSE
Direct Radiation	SSE-5	North of Entrance to Miramar	TLD	Quarterly	5.1	SSE
Direct Radiation	SSE-10	Elliot Museum	TLD	Quarterly	10.2	SSE
Direct Radiation	SE-1	South of Cooling Canal	TLD	Quarterly	1	SE
Direct Radiation	*H-32	U. of Florida - 1FAS Entomology Lab Vero Beach	TLD	Quarterly	18.1	NNW
Airborne	H08	FPL Substation - Weatherbee Road	Radioiodine & Particulates	Weekly	6	WNW
Airborne	*H12	FPL Substation - SR 76, Stuart	Radioiodine & Particulates	Weekly	12	S
Airborne	H14	Orisite - near south property line	Radioiodine & Particulates	Weekly	1	SE
Airborne	H30	Power Line - 7609 Indian River Drive	Radioiodine & Particulates	Węekly	2	W

1

* Denotes Control Sample

REVISION NO .:	PROCEDURE	Î TITLE:	·		PA	(GEI
50 PROCEDURE NO.:	_	OFFSITE DOSE CALCULATIC)n manual (o	DCM)		219 of 231
C-200		ST. LUCIE PL	.ANT		1	
		APPENDIX B RADIOLOGICAL ENVIRONMENT (Page 3 of 4)	} 'AL SURVEILL. 	ANCE		
		ST. LUCIE PLA Key to Sample Loc	NT ations			
PATHWAY	LOCATION	DESCRIPTION	SAMPLES COLLECTED	SAMPLE COLLECTION FREQUENCY	APPROXIMATE DISTANCE (miles)	DIRECTION SECTOR
Airborne	H34	Onsite - At Meteorological Tower	Radioiodine & Particulates	Węekly	0.5	N
Waterborne	H15	Atlantic Ocean vicinity of public beaches east side of Route A1A	Surface Water (ocean) Sediment from shoreline	Weekly Semi-Annually	< 1	ENE/E/ESE
Waterborne	*H59	Near south end of Hutchinson Island	Surface Water (ocean) Sediment from shoreline	Monthly Semi-Annually	10-20	S/SSE
Food Products	H15	Ocean side vicinity of St. Lucie Plant (NOTE 1)	Crustacea Fish	Semi-Annually Semi-Annually	<1	ENE/E/ESE
Food Products	H51	Offsite near north property line	Broad Leaf vegetation	Monthly (when available)	1	N/NNW

* Denotes Control Sample

REVISIÓN NÔ.: 50 PROCEDURE NO.:	PROCEDURE		ION MANUAL (C	DDCM)	PA	220 of 231
C-200		ST. LUCIE F	PLANT			
		APPENDIX RADIOLOGICAL ENVIRONMEN (Page 4 of	B <u>ITAL SURVEILL</u> 4)	ANCE		
		ST. LUCIE PL Key to Sample Lo	ANT ocations			
PATHWAY	LOĊATION	DESCRIPTION	SAMPLES COLLECTED	SAMPLE COLLECTION FREQUENCY	APPROXIMATE DISTANCE (miles)	DIRECTION SECTOR
Food Products	H52	Offsite near south property line	Broad leaf vegetation	Monthly (when avajlable)	1	S/SSE
Food Products	*H59	Near south end of Hutchinson Island	Crustacea Fish Broad leaf vegetation	Semi-Annually Semi-Annually Monthly	10-20	S/SSE

* Denotes control sample

It is the policy of Florida Power & Light Company (FPL) that the St. Lucie 1 & 2 Radiological Environmental Monitoring Programs are conducted by the State of Florida Department of Health (DOH) and Bureau of Radiation Control (BRC), pursuant to an Agreement between FPL and DOH and; that coordination of the Radiological Environmental Monitoring Programs with DOH and compliance with the Radiological Environmental Monitoring Program controls are the responsibility of the Nuclear Plant Support Services Department.

<u>NOTE 1</u>

These samples may be collected from or supplemented by samples collected from the plant intake canal if the required analyses are unable to be performed due to unavailability or inadequate quantity of sample from the ocean side location.

END OF APPENDIX $\boldsymbol{\mathsf{B}}$

50	OFFSITE DOSE CALCULATION MANUAL (ODCM)	221 of 221
PROCEDURE NO.:		221 01 231
_ C-200	ST. LUCIE PLANT	
-	APPENDIX B-1 ST. LUCIE SUPPLEMENTAL REMP SAMPLING	
	(Page 1 of 3)	

The sampling and analysis program-outlined in this appendix is performed in addition to the St. Lucie REMP sample and analysis program required by Control 3.12.1. These samples are not required to satisfy the REMP-Program nor required to be reported in the Annual Radiological Environmental-Operating Report. Supplemental samples are performed to provide a broader_data base for the Radiological Environmental Monitoring Program.

* Approximate Distance from plant in miles

Pathway: Direct Exposure via TLD

Sampling and Collection Frequency: Quarterly Collection

(
Name	-Sector	Distance *	Description
H-08	WNW	6	FPL Substation (White City Sub), Weatherbee Rd
H-09	SSW	7	FPL Substation (Jensen Sub), US-1 South of St. Lucie County Line
H-12	S	12	FPL Substation (Stuart Sub), SR-76, West of Stuart by High School
H-14	SE	1	South Site Property Line
H-33	ESE	<1	On-site, North of Intake Canal, West of Dunes
H-34	N	0.5	On-site, Meteorology Tower
H-60	NE	<1	Utility Pole, A1A, East of TAB
H-61 & H-62	SW	<1	Canal Dredging Spoils Mound

Pathway: Airborne Radioiodines and Particulates

Sampling and Collection Frequency: Samples Collected Weekly;

1. lodine - Gamma-Spec Analysis

2. Particulate - Gross-Beta and Composite Gamma-Spec Analysis

Name	Sector	Distance *	Description
H-09	SSW	7	FPL Substation (Jensen Sub), US-1 South of St.
			Lucie County Line
H-32	NNW	19	HRS Entomology Lab., East of US-1, Vero Beach
H-33	ESE	<1	On-site, North of Intake Canal, West of Dunes

REVISION NO .:	PROCEDURE TITLE:	PAGE:
50	OFFSITE DOSE CALCULATION MANUAL (ODCM)	200 - 6 0 24
PROCEDURE NO.:		222 01 231
C-200	ST. LUCIE PLANT	
-	APPENDIX B-1 ST. LUCIE SUPPLEMENTAL REMP SAMPLING (Page 2 of 3)	
	NOTE	
* Approxin	nate Distance from plant in miles.	

Pathway: Waterborne, Surface Water

Sampling and Collection Frequency: Monthly Collection; Gamma-Spec and Tritium-Analysis

Name	Sector	Distance *	Description
H-13	NNW/N	<1	On-site, North Bank of Big Mud Creek, Between
(-		Pump Station and Meteorology Tower
H-36	NE/ENE	<1	On-site, Discharge Canal, West Side A1A 5/6/96
			On-site, Discharge Canal, Near Bridge

Pathway: Waterborne, Sediment

Sampling and Collection Frequency: Semi-Annual Collection and Gamma-Spec Analysis

Name	Sector	Distance *	Description
H-13	NNW/N	<1	On-site, North Bank of Big Mud Creek, Between
			Pump Station and Meteorology Tower
_ H-16Ξ	N	1	Ocean Covered Sand, Beach Opposite Blind
			Creek, North of Discharge Canal
H-19	SE	1	Ocean Covered Sand, Beach South of Intake
			Canal
H-36	NE/ENE	<1	On-site, Discharge Canal, West Side A1A

Pathway: Waterborne, Beach Sand

Sampling and Collection Frequency: Semi-Annual Collection and Gamma-Spec Analysis

H-15 NE/ H-16	ENE/E	<1	On-site, Beach Near Discharge Structure
H-16			
	N	1	Ocean Covered Sand, Beach Opposite Blind
			Creek, North of Discharge Canal
H-19	SE	1	Ocean Covered Sand, Beach South of Intake
			Canal

50 OFFSITE DOSE CALCULATION MANUAL (ODCM) 223 of ROCEDURE NO: C-200 ST. LUCIE PLANT 223 of APPENDIX B-1 ST. LUCIE SUPPLEMENTAL REMP SAMPLING (Page 3 of 3) * Approximate Distance from plant in miles. * # Although the Name remains the same, the locations can vary with sample availability. * Pathway: Ingestion, Garden Crop * Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Private Residence, Indian River Dr. *	50 PROCEDURE NO C-20	0			
ROCEDURE NO.: C-200 ST. LUCIE PLANT 223 of APPENDIX B-1 ST. LUCIE SUPPLEMENTAL REMP SAMPLING (Page 3 of 3) (Page 3 of 3) * Approximate Distance from plant in miles. # # Although the Name remains the same, the locations can vary with sample availability. Pathway: Ingestion, Garden Crop Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description Sampling and Collection Frequency:	PROCEDURE NO C-20		FFSITE DOSE	E CALCULATION MANUAL (ODCM)	0.1-000
C-200 ST. LUCIE PLANT APPENDIX B-1 ST. LUCIE SUPPLEMENTAL REMP SAMPLING (Page 3 of 3) * Approximate Distance from plant in miles. # Approximate Distance from plant in miles. # Atthough the Name remains the same, the locations can vary with sample availability. Pathway: Ingestion, Garden Crop Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description Description	C-20).:			223 of 2
APPENDIX B-1 ST. LUCIE SUPPLEMENTAL REMP SAMPLING (Page 3 of 3) NOTE * Approximate Distance from plant in miles. # Although the Name remains the same, the locations can vary with sample availability. Pathway: Ingestion, Garden Crop Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description H-41 W Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description Name # Sector Distance * Description		0	ST. LUCIE PLANT		
APPENDIX B-1 ST. LUCIE SUPPLEMENTAL REMP SAMPLING (Page 3 of 3) NOTE NOTE * Approximate Distance from plant in miles. # # Although the Name remains the same, the locations can vary with sample availability. * Pathway: Ingestion, Garden Crop * Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description H-41 W 2 Private Residence, Indian River Dr. * Pathway: Ingestion, Citrus * Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description		1	<u> . </u>		
(Page 3 of 3) NOTE * Approximate Distance from plant in miles. # Although the Name remains the same, the locations can vary with sample availability. Pathway: Ingestion, Garden Crop Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description H-41 W 2 Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Collection Frequency: Annual Collection and Gamma-Spec Analysis Mame # Sector Distance * Description		S		APPENDIX B-1 PLEMENTAL REMP SAMPLING	.46
NOTE * Approximate Distance from plant in miles. # Although the Name remains the same, the locations can vary with sample availability. Pathway: Ingestion, Garden Crop Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description H-41 W Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description		<u></u>		(Page 3 of 3)	
* Approximate Distance from plant in miles. # Although the Name remains the same, the locations can vary with sample availability. Pathway: Ingestion, Garden Crop Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description H-41 W 2 Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description	1			NOTE	
# Although the Name remains the same, the locations can vary with sample availability. Pathway: Ingestion, Garden Crop Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description H-41 W 2 Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description	-* A	pproximate	Distance from	n plant in miles.	
# Although the Name remains the same, the locations can vary with sample availability. Pathway: Ingestion, Garden Crop Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description H-41 W 2 Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description Mame # Sector Distance * Description					
Sample availability. Pathway: Ingestion, Garden Crop Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description H-41 W 2 Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description	# A	Ithough the	Name remain	s the same, the locations can vary wit	h [
Pathway: Ingestion, Garden Crop Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description H-41 W 2 Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description		ample avail	ability.	· · · · · · · · · · · · · · · · · · ·	
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Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description H-41 W 2 Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance *	Pathway: I	ngestion, G	arden Crop		
Name # Sector Distance * Description H-41 W 2 Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance *	Sementine .	und Circilla of		w Americal Callection and Comme	a Analysia
Name # Sector Distance * Description H-41 W 2 Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description	- -	ind Collect	lion Frequenc	y: Annual Conection and Gamma-Spe	ec Analysis
H-41 W 2 Private Residence, Indian River Dr. Pathway: Ingestion, Citrus Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance *	Name #	Sector	_Distance *	Description	
Pathway: Ingestion, Citrus Sampling and Collection Frequency: Annual Collection and Gamma-Spec Analysis Name # Sector Distance * Description	H-41	W	2	Private Residence. Indian River Dr.	
Name # Sector Distance * Description					
	Name #	Sector	Distance *	Description	
H-23 W 5 Vicinity of US-1 and Easy St.	H-23	W	5	Vicinity of US-1 and Easy St.	
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50		•	ULATION MANUAL (ODCM)						
PROCEDURE N	10.:				$1 224 \text{ of } 231_{\odot}$				
C-200				ST. LU					
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D 4									
<u>RA</u>	DIOLOGICA		<u>AL SAM</u>	PLING IN SUPP	ORT OF THE GROUNDWATER PROTECTION INITIATIVE				
				(Page	+ T OT <i>Z</i>)				
				STILLC					
				Kev to Sam	ple Locations				
STATE	PSL ID	SAMPLE	S	SAMPLE	LOCATION DESCRIPTION				
ID		COLLECT	ED	FREQUENCY					
H70	GIS-MW-E	S Tritium / Gar	mma	Quarterly	West of A1A; between the discharge canal and Gate "B"				
H71	GIS-MW-E	El Tritium / Gar	mma 📗	Quarterly	West of A1A; between the discharge canal and Gate "B"				
H72	GIS-MW-S	SI Tritium / Ga	mma	Quarterly	South of Intake canal and the adjacent access road				
H73	GIS-MW-SV	NS Tritium / Gar	mma	Quarterly	S/W corner of Intake canal and the adjacent access road				
H74	GIS-MW-S	WI Tritium / Ga	mma 📔	Quarterly	S/W corner of Intake canal and the adjacent access road				
H75	GIS-MW-V	VI Trițium / Ga	mma	Quarterly	West of plant site and intake canal; South of switchyard				
H76	H76	Tritium / Ga	mma	Quarterly	North of Simulator; South of Big Mud Creek				
H77	H77	Tritium / Ga	mma	Quarterly	East of Barge Slip; By LU bldg				
H78	H78	Tritium / Ga	mma	Quarterly	South of North Warehouse				
H79	H79	Tritium / Ga	mma	Quarterly	West of A1A and East of Parking Lot				
		10	1						

It is the policy of Florida Power & Light Company (FPL) that the St. Lucie 1 & 2 Radiological Environmental Monitoring Programs are conducted by the State of Florida Department of Health (DOH) and Bureau of Radiation Control (BRC), pursuant to an Agreement between FPL and DOH and; that coordination of the Radiological Environmental Monitoring Programs with DOH and compliance with the Radiological Environmental Monitoring Program Controls are the responsibility of the Nuclear Plant Support Services Department.

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C-200	ST. LUCIE PLANT]- ()
	APPENDIX B-2	
RADIOL	OGICAL ENVIRONMENTAL SAMPLING IN SUPPORT	OF THE
	-GROUNDWATER PROTECTION INITIATIVE	
	(Page 2 of 2)	
Intil further notice	e, sample collection points, sampling periodicity, and anal	yses to be
liscretion of the C	Chemistry-Manager.	() Shall be at the
	END OF APPENDIX B-2	









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50			OFFSITE DOSE CALCULATION MANUAL (ODCM)								
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C-200)	ST. LUCIE PLANT								
DESCRIPTION OF THE INTERLABORATORY COMPARISON PROGRAM (ICP)											
	(Page 1 of 2)										
The S shall p	The State of Florida, Department of Health-Bureau of Radiation Control (BRC) Laboratory shall participate in an INTERLABORATORY COMPARISON PROGRAM.										
1.	The sample matrices and analytical methods shall be:										
	A.	Gamm particu	a isotopic on a filter sample simulating airborne radioic late collection.	odine and							
	В.	Gamm	na isotopic on a water sample simulating a surface wate	er grab sample.							
	C.	Gamm	na isotopic on either sediment (or soil) or broad leaf-veg	jetation.							
1											
			NOTE								
		Step	os D, E and F reference NRC IR 99-04, PMAI 99-0716.								
	D.	Gross Beta on an Air Filter matrix.									
	E.	Tritium in water, using method employed in REMP.									
F. Gamma isotopic on a water sample (above) is used for milk matrix if n samples are being-obtained per land use census identified milk anima within 5 miles of the plant site.											
2.	The s	ource o	f samples for this program:								
	A.	A Fede Drinkir	eral Government Laboratory Program (e.g., DOE-MAP) ng Water Program)	EP, EPA Safe							
	Β.	A State NIST t meet t	e, Federal, or private (commercial) laboratory capable (raceable samples. To be eligible, a Commercial Labor he FPL Quality Assurance criteria of "Quality Related".	o <u>f</u> providing atory shall							
	C.	For Ga sample provide vendo FPL pe quanti	amma Analysis only, a FPL Nuclear Site Laboratory ma e matrices using known quantities of radioactivity from ed by a FPL Contract Laboratory currently approved as r. These prepared matrices may be prepared by the ve ersonnel, but shall not exceed the participant(s) form a ties for allowed radioactivity.	ay prepare isotopes s PC-1 Level endor, or by nd/or license							
3.	Analy presc	sis of M ribed LL	latrix samples shall be capable of achieving ODCM Tal _Ds on a blank sample.	ble 4.12-1							

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	APPENDIX D								
DESCRIPTION OF THE INTERLABORATORY COMPARISON PROGRAM (ICP)									
	(Page 2 of 2)								
4. Results withi	n 20% of expected shall be considered acceptable. Rea	sults							
exceeding 20	0% but within 35% require a description of probable cau	se and actions							
considered N	performed to bring the analysis into conformance. Results exceeding 35% are considered Not Acceptable: the Matrix shall be replaced and reanalyzed								
5. The frequence	cy for performing the interlaboratory comparison program	n shall be							
annually with		illai matrices							
		-							
—									