IE28

ENCLOSURE 1

Updates Included In This Submittal

DIABLO CANYON EMERGENCY PLAN IMPLEMENTING PROCEDURES

Volume 3A

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[4] (1 4		Pacific Gas and Electric Company	NUMBER REVISIO	EP R-2 N 5
5	DEPARTMEN	T OF NUCLEAR PLANT OPERATIONS	DATE	6/15/84
	DIABLO CAN	IYON POWER PLANT UNIT NO(S) 1 AND 2	PAGE	1 OF 72
U	TITLE	EMERGENCY PROCEDURE RELEASE OF AIREGRNE RADIOACTIVE MATERIALS		
	APPROVED	R. C. Thombury	8-1-84	MPORTANT TO
		PLANT MANAGER	DATE	SAFETY

SCOPE

This procedure describes the steps to be taken to initially evaluate and recover from the consequences of an airborne release that results in an Unusual Event, Alert, Site Area, or General Emergency. It does not describe the operation of the plant equipment necessary to terminate or minimize the release. This latter subject is covered in the appropriate OP series Emergency Procedure for the particular release mechanism. This procedure and changes thereto requires PSRC review.

GENERAL

Any release of radioactive material in excess of that allowed by Technical Specifications will require corrective action to eliminate the release. In addition, actions will be required to assess the effect of the release on personnel on-site and the general public in the vicinity of the site. (See Figure 1.) The calculations required for the assessment are described in the appendices to this procedure. Figure 2 provides a flow chart for use in deciding which appendices to use.

SYMPTOMS

- The following symptoms in a Radiological Controlled Area indicate that an airborne release may be occurring in the Controlled Area:
 - a. There is actual or suspected leakage of water, steam, or noncondensible gases from any vessel or piping system containing primary coolant, liquid radwaste, or gaseous radwaste.
 - b. Damage occurs to a submerged, irradiated fuel assembly with the resultant release of significant quantities of noncondensible gases.
 - c. Alarms occur on CAMs.

DIABLO CA	NYON PO	WER PLAN	NT UNIT NO(S)	1 AND 2	NUMBER E REVISION 5 DATE 6 PAGE 2	P R-2
TITLE P	RELEASE	OF AIRB	ORNE RADIOACTIVE M	ATERIALS		01 72
	d.	A fir	e occurs in radioa	ctive materials.		
	e.	G-M ty increa	ype survey instrum asing background c	ents in the area begi ount rate.	n to show an	
		NOTE:	The external dos near MPC is very rate meter. How increase on a G-	e rate produced by ai low and may not be n ever, it produces a n M survey instrument.	rborne levels oticed on a dos oticeable	e
	f.	A majo	or radioactive mat	erial spill occurs.		
2	. The ide dep det "Ac How lea	ere are n entify an ending u ail in t cident (ever, th st one o	numerous indicatio nd diagnose a poss upon the mechanism the OP series Emer Classification and he most likely sym of the area and/or	ns available in the c ible airborne release of the release, and gency Procedures and Emergency Plan Activ ptom(s) will involve process radiation mo	ontrol room to . These vary are covered in EP G-1, ation." alarms on at nitors.	
1	MMEDIAT	E ACTION	VS			
1	. Per	sonnel i	in the Area			
	a.	Unless and/or to acc	s qualified and eq r respiratory equi cess control.	uipped with appropria pment, evacuate the a	te monitoring rea and proceed	
	b.	Notify	the control room	이 사람은 것이 같		
2	. The	Shift F	Foreman (interim S	ite Emergency Coordin	ator) shall:	
	a.	Clear	the affected area			
		This c signal follow	an be done most e . The emergency s ving circumstances	fficiently by sounding signal shall be sound :	g the emergency ed for the	
		1) A	Airborne contamina 'High Radiation (I	tion is widespread. I n-Plant)."	Refer to EP R-4,	• +
		2) M a	Major damage occurs oppropriate OP prov Classification and	s to plant equipment. cedure or EP G-1, "Acc Emergency Plan Activa	Refer to cident ation."	
		3) S	ite evacuation mag Evacuation of None	y be necessary. Refe essential Site Person	r to EP G-5, nel."	L

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DIABLO CAN	YON PC	WER PL	ANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 3 OF 7
TITLE RE	LEASE	OF AIF	RBORNE RADIOACTIVE	MATERIALS	
		4)	Mobilization of p G-2, "Establishme Organization" and Accountability."	personnel is necessar ent of the Onsite Eme d EP G-4, "Personnel	ry. Refer to EP ergency Assembly and
		5)	The Shift Foreman	n deems it necessary.	. 영화 영화 (1997) 영향
	b.	Esta orga Clas	blish an appropria nization in accord sification and Eme	ate interim onsite en dance with EP G-1, "A ergency Plan Activati	nergency Accident on."
		1)	Assign operators appropriate OP se	to terminate the rel ries emergency proce	ease using dures.
		2)	Have the Emergenc (normally the Shi causing the relea classification. the actual or pot verify the classi this preliminary Subsequent Action	y Evaluations and Re ft Engineer) evaluat se to determine init Then begin prelimina ential severity of t fication. Instructi evaluation are conta s section of this pr	covery Coordinator te the events tial ry evaluation of the release and ons for performing ined in the ocedure.
		3)	Assign the Emerge Liaison Assistant required of offsi accordance with E Emergency Organiz Offsite Organizat	ncy Liaison Coordina to initiate the not te agencies and plan P G-2 "Establishment ation" and EP G-3 "N ions."	tor and the ifications t staff in of the Onsite otification of
	c.	Trea "Pers Over	t any injured pers sonnel Injury (Rad exposure."	onnel in accordance iologically Related)	with EP R-1, and/or
SUB	SEQUE	T ACT	IONS		
1.	Subs	equent	t Actions Common to	o All Events	
	a.	Perfo long EP G	orm notification re- term onsite emerge -2, "Establishment	equired to establish ency organization in of Onsite Emergency	an appropriate I accordance with Organization."
		NOTE	Sounding of the notification dur	Site Emergency Sign ring normal working	al is sufficient
	b.	Alert "Noti	t offsite organizat ification of Offsit	tions in accordance w te Organizations."	with EP G-3,
					F
DCO	249 3	V			

	ON PO	WER P	LANT UNIT NO(S) 1 AND	2	NUMBER REVISION DATE PAGE	EP R-2 5 6/15/84 4 OF 7
TITLE REL	CASE	OF AI	RBORNE RADIOACTIVE MATERIALS			
		1)	Prompt notification of County authorities should occur withi the Unusual Event class and so need for other emergency actio	and other off in about 15 mi coner (consist ons) for other	site nutes for ent with classes.	the
		2)	Periodic updates on the status be provided to the County and organizations. Use Form 69-10 Notification Form," giving as known at the time. The inform form 69-10262 should be develo possible in the evaluation, an EOF staffs when available.	of the emerge other offsite 581, "Initial much informat: ation in parts ped as complet d provided to	ency shal Emergenc ion as is s A and B tely as the TSC a	l y of and
	c.	Eval pers Proc and/	uate the internal exposure rece onnel using the instructions gi edure R-1, "Personnel Injury (R or Overexposure."	ived by affect ven in Emerger adiologically	ed ncy Related)	
2.	Clas	ssify	the Emergency			
	â.	Gene	ral			
		1)	To a large extent, subsequent is the potential severity of the by the emergency classification Emergency Evaluations and Recor- shall inform the Site Emergency earliest possible time whether classified as an Unusual Event General Emergency using the app Operating Procedure and EP G-1 Classification and Emergency P	actions are ba occurrence, as n. Therefore, very Coordinator the emergency , Alert, Site propriate Emer , "Accident lan Activation	sed upon identifi the or (EERC) at the is Area or gency ."	ied
			NOTE: If core damage is a poss Engineer should be direct towards its assessment a classifying the accident someone else, such as an Operator.	sibility, the ting his atte and the task o t shou'd be as n Assistant Co	Shift ntion f signed to ntrol	1
		2)	The EERC shall keep the Site En apprised of any suggested escal	mergency Coord lation or redu	inator ction of	

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DIABLO CANYON	OF AIRBORNE	NIT NO(S) RADIOACTIVE M	1 AND 2 ATERIALS	REVISION 5 DATE 6/1 PAGE 5	R-2 5/84 OF 72
b.	How to Ver	ify the Initi	al Classification of	the Emergency	1
	There are classifica the accide	three general tion of an em nt scenario:	methods for verifyin ergency which is init	ng the tially based on	1
	- estim	ate actual re	lease rate,		
	- use a	ccident summa	ry sheets, or		۴
	- perfo	rm offsite mo	nitoring.		
	Each	of these is d	iscussed below.		
	The m to di break class -	ethod for ini agnose the mo , gas decay t ification on Go to the app the guidance classify the	tially classifying the st likely cause (LOCA ank rupture, etc.) ar this information. ropriate OP series pr contained therein (Ap accident.	he emergency is A, steam line ad base the rocedure and use opendix Z) to	
		If the emerge procedure, or procedure is situation, go	ncy does not fit any if the guidance in t inappropriate for the to EP G-1.	OP series the OP series actual	1
		EP G-1 gives scenarios whi classificatio consistent wi approximates	examples of typical e ch fall into each acc n. Classify the emer th the scenario which the actual situation.	emergency ident gency at a level most closely	
	-	If multiple e simultaneousl release of ra what it would the emergency otherwise hav single occurr	mergency situations a y, such that the prob dioactive materials i be for a single occu one level higher that e been based on the m ence.	are occurring bability of a s increased over urrence, classify an it would most severe	
	1) Verif Rate	y Emergency C	lassification Based ()n Actual Release	1

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DIABLO	RELEASE O	WER PLANT U	RADIOACTIVE MA	1 AND 2	REVISION 5 DATE 6/1 PAGE 6	K-2 5/84 OF 72
					1.4.4.4.4	
		a)	General			
			The best way to accident scena the release ra boundary dose (See Appendix information to to the followi	o verify classificat rio is to estimate t te and compare that criteria for each cl 1). However, using classify the emerge ng:	tion based on the the magnitude of to the site assification release rate ency is subject	
			 If the classification If the classification EP G-1 spin events barelease, must be u or can no 	assification based us scenario is more set ted by release data, ive (emergency scena ation. The reason f ecifies a classification sed upon the <u>potentiand</u> and this conservative sed even if the actu- t materialize.	pon the evere than would use the rio) for this is that tion for many al for a re classification al release does	
			(2) If the re classific classific the conse release d considered	lease data indicates ation more severe th ation based upon the rvative classificati ata, <u>if the release</u> d to be reliable.	a an the scenario, use on based on data is	
			(3) Both whole considered upon reled based upon values.	e body and thyroid e d when making a clas ase data. Classify n the most conservat	exposure must be sification based the emergency tive of these two	
		b)	Dose (and Rele an Emergency	ase Rate) Criteria f	for Classifying	1
			The criteria f dose are summa criteria are g cannot be done	or classifying an en rized in Appendix 1. iven for use if a do	Release rate se calculation	
		c)	Instructions			
			Regardless of on EARS or mani follows:	whether the calculat ually the basic tech	ion is performed nique is as	1

DIABLO CANYON POWER	PLANT UNIT NO(S)	1 AND 2	NUMBER EP F REVISION 5 DATE 6/19 PAGE 7	R-2 5/84 DF 72
TITLE RELEASE OF AIR	BORNE RADIOACTIVE MA	ATERIALS		
	 (1) Determine Appendix possible, necessary 	e the classification 1. Use real meteoro , or the default valu y.	criteria using logical data if es given as	
	(2) Determine rates in on actual estimates sample da instructi methods.	e the noble gas and in curies/second. These I radiation monitor re- s derived from the FS. ata. The Appendices ions for the following	odine release e may be based eadings or AR cases or tank give detailed g common	
	 (a) Use RE-1 (b) Use (See (c) Use cool rupt 	of plant vent noble 14 or RE-29. (See Appending of plant vent iodine e Appendix 3.) of main steam line mulant sample results du ture. (See Appendix 4	gas monitors endix 2.) monitor RE-24. onitors or RCS uring S/G tube 4.)	
	(3) Compare t the crite assumptio Appendix	the estimated release eria values. Formulae ons used for this comp 5.	rate data with e and parison are in	
2)	Classify Emergency	Using Accident Summar	ries	
	Appendix 6 contains analyzed in the FSA severity of an acci in EARS can be modi conditions.	s summary sheets for e AR. They can be used ident. If EARS is in ified to reflect actua	each accident to estimate the use the summary al plant	
3)	Classify Emergency	Based On Field Monito	oring Data	
	a) General			
	As discussed i classification rates at the s field data tak provide a dire accident. In best technique that you will because it tak monitoring tea data on radiat	in Appendix 1, the acc definitions are base ite boundary. In the en at the site bounda ect method of classify practice, this is only because there is the miss the plume center ies considerable time ims. This will, however tion exposure to person	cident ed upon dose eory, therefore, ary should ying the ly the third e possibility r, and also to deploy yer, provide onnel.	1

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DIADLO CAN	ON POW	VER PLANT UNIT NO(S) 1 AND 2 NUMBER REVIS DATE PAGE	R EP R-2 ION 5 6/15/84 8 OF 72
TITLE REL	EASE O	F AIRBORNE RADIOACTIVE MATERIALS	
		b) Instructions	
		Appendix 5 summarizes the basic formulas rel to environmental monitoring that are useful classifying accidents and in projecting dose	lated in es.
	NOTE	: At this point, the emergency classification is confi Go to Steps 3, 4, 5, or 6 for Unusual Event, Alert, Area Emergency, or General Emergency, respectively. alert for changes in plant conditions necessitating classification change.	irmed. Site Be a
3.	Subs	equent Actions for an Unusual Event	
	a.	Make the best possible quantification of the extent of offsite release using the results of air samples, effi- monitors, environmental monitoring, or other technique	F fany luent as.
	b.	Conduct appropriate cleanup and re-entry operations.	
		NOTE: General guidelines for cleanup and re-entry are contained in EP RB-6, "Area and Equipment Decontamination."	' I
	с.	Close-out the event with a verbal summary to offsite agencies and complete the following written reports:	
		 Plant Problem Report (see Nuclear Plant Administr Procedure C-12). 	ative
		2) Written summary within 24 hours.	
	d.	All records generated by the utilization of this proce for an exercise or emergency shall be forwarded the ne working day to the Assistant Plant Manager/Support Ser for review and retention.	dure xt vices
		1) Records generated from exercises will be categori non permanent and retained for a minimum of five	zed as years.
		2) Records generated from actual emergency events wi categorized as lifetime and placed into lifetime storage in accordance with procedure "Requirement Retention and Extended Storage of Operation Phase Activity Records (AP E-1S1)."	11 be s and

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TITLE RE	ELEASE	OF AIREOR	NE RADIOACTIVE	1 AND 2	REVISION DATE PAGE	5 6/15/84 9 OF 7
.4.	. Sub	sequent A	ctions for an A	Alert		F
	a.	lf the protect the thre monitor Monitor to deter onsite p	release has the ive measures (i eshold levels f ing in accordan ing." Make a c rmine if any pr personnel.	e potential for necess i.e., if it is more th for an Alert), initiat nece with EP RB-7 "Ons theck of downwind ons rotective measures are	sitating onsite han about 10 tim te onsite ite Radiological ite assembly are a needed for	nes Has
	b.	If the r personne evacuati Coordina (preferr of the r G-5, "Ev evacuati	results of the al are receivin ion can measura ator shall orde red) or to an u release is expe acuation of No ion criteria.	initial assessment in og significant exposur bly reduce it, the Si in their evacuation ei pwind site location (octed to be very short nessential Site Perso	dicate that sit res, and that te Emergency ther offsite if the duration c). Refer to EP onnel" for	e
	c.	Provide authorit projecti	periodic meteo ies and, if an ons for actual	rological assessments y releases are occurr releases.	to offsite ing, dose	
		1) Act met	ivation of EAR hod for transm	S in the EARAUT mode itting dose projectio	is the preferre	d
		2) If (EA han to inf per ass	EARS is not aver RAUT) or manua d calculations Procedures EP I ormation and as sonnel are avait essment information	ailable in either the 1 (EARMAN) mode, perf using Appendices 2 - RB-8 through 12 for a ssessment guidance as ilable. Use form 69- ation when appropriat	automatic orm appropriate 5. Refer also dditional additional 10262 to transm e.	it
	d.	Perform	Comprehensive I	Follow-up Surveys Ons	ite	
		1) Per	sonnel Assembly	y Areas		
		Alt at sub or per	hough a prelimi personnel assen stantially in e recheck these l mit, with the f	inary assessment shou mbly areas, if the re excess of limits, it locations as time and following objectives:	ld have been mad lease was is wise to check conditions	de K
		a)	To verify than required if period base	at long-term evacuation personnel were not pro- sed upon the initial a	on is not eviously assessment.	

	POWER P	LANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 10 OF 72
TITLE RELEAS	E OF AI	REGRNE RADIOACTIVE	MATERIALS	
	4-	 b) To obtain in were not ob significant matter were long since 	cdine and particulate tained earlier (assumi quantities of iodine released, and that th passed).	samples if these ng that and particulate we cloud has not
		c) To run smeal decontaminat ac ivity is cointed on a decermining have been exposure is whole body of	r surveys to see wheth tion is required. If found, the smear pads a Multi Channel Analyz the isotopes to which xposed. (If significa suspected, the person counted.)	er significant should be er to assist in persons might nt personnel s should also be
	2)	Remainder of Site	e	
		Downwind areas where the checked for conditioned for conditional determining the restored subsequent isotop	hich may have been con ontamination to provid necessity and extent o ar samples should be r bic analysis if requir	taminated should e data for f cleanup etained for ed.
e.	. Perf	form Offsite Monito	oring as Warranted	
	If t indi be f nece that gove moni purp	the estimate of cur cates that offsite for most Alert cond ssary. However, i offsite locations rnment agencies sh toring program sho oses:	rie release and/or ons e effects are negligib ditions), offsite moni if there is a realisti s may have become cont hould be alerted and a buld be instituted for	ite monitoring le (as they would toring may not be c possibility aminated, local n offsite the following
	1)	Determine the nee impoundment of fo evacuation is not	d for long-term decon odstuffs, even if off required.	tamination or site personnel
		NOTE: These deci government government EP RB-10,	sions are the respons agencies. However, al recommendations are "Protective Action Gu	ibility of local current e summarized in idelines."
	2)	Allay any public	concern.	
	21	Obtain background	data for reports to	regulatory

.

DIABLO CANYON P	OWER P	LANT UNIT NO(S)		1 AND 2	NUMBER EP R REVISION 5 DATE 6/15/ PAGE 12 (-2 /84 DF 72
NTLE RELEASE	E OF AI	RBORNE RADIOAC	TIVE MATER	TALS		
	lf com soo 69- for pot cha	protective act municated to Si n as approved 1 10581, "Initia changes in pla ential release nge in appropri	ions are a an Luis Ob by the Sit l Emergenc ant condit to an imm iate prote	ppropriate, ispo County, e Emergency y Notificati ions, which inent releas octive action	this should be without delay, as Coordinator (see Form on Form"). Be alert may change a se (with a resultant a).	
b.	Pro aut pro	vide periodic r horities and, jections for ad	meteorolog if any rel ctual rele	ical assessm eases are oc ases.	ents to offsite curring, dose	
	1)	Activation of method for the	f EARS in ransmittin	the EARAUT M g dose proje	de is the preferred ctions.	
	2)	If EARS is no (EARAUT) or m hand calculat to procedures information a personnel are assessment in	ot availab manual (EA tions usin s EP RB-8 and assess availabl nformation	le in either RMAN) mode, g Appendices through 12 f ment guidanc e. Use Form when approp	the automatic perform appropriate 2 - 6. Refer also or additional e as additional 69-10262 to transmit riate.	
с.	Pert	form Offsite Mo	onitoring			
	A St such evac impo bour prog	te Area Emerge that some off uation of pers bundment of foo dary. Therefo gram should be	ency releat fsite prote cons in po odstuffs, n ore, a neat establishe	se is of suf ective measu rtions of th may be requi rsite and of ed for the f	ficient magnitude res, such as e LPZ, or long-term red near the site fsite monitoring ollowing purposes:	1
	1)	Initially, th identifying t exposure exis to prevent pe evacuation cr 5 rem thyroid	te program hose area: ts person rsons from iteria do: l.	should be d s where meas nel evacuati m exceeding ses of 500 m	irected toward urable radiation on may be necessary the recommended rem whole body and/or	1
	2)	Once any imme program shoul long-term dec which may be personnel eva	diate evad d be set u ontaminati desirable cuation wa	cuation is a up to determ ion or impour even in are as not requi	ccomplished, the ine the need for ndment of foodstuffs, as where prompt red.	
		NOTE: These govern govern RB-10,	decisions ment agenc ment recon "Protecti	are the responses of the second se	ponsibility of local er, current are summarized in EP uidelines."	

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DIABLO CANYON PO	DE ALPROPHE PADLOACTIVE MATERIALS
	OF ATROCHTE RADIOACTIVE MATERIALS
f.	Conduct appropriate post-accident cleanup and re-entry operations.
g.	Close-out the event with a verbal summary to offsite agencies and complete the following written reports:
	 Plant Problem Report (see Nuclear Plant Administrative Procedure C-12).
	2) Written summary within 8 hours.
h.	All records generated by the utilization of this procedure for an exercise or emergency shall be forwarded the next working day to the Assistant Plant Manager/Support Services for review and retention.
	 Records generated from exercises will be categorized as non permanent and retained for a minimum of five years.
	 Records generated from actual emergency events will be categorized as lifetime and placed into lifetime storage in accordance with procedure "Requirements for Retention and Extended Storage of Operation Phase Activity Records (AP E-ISI).
5. Sub	sequent Actions for a Site Area Emergency
a.	Consider protective actions required.
	Table 1 summarizes the decision criteria for initial protective actions for an event classified as a Site Area Emergency. The protective actions which are appropriate for initial consideration are evacuation of the site and protective action zone (PAZ) 1 (The two mile radius of the plant) or a precautionary evacuation of transients on the 6-mile radius low population zone (PAZ-1 and PAZ-2). As shown in the table, neither action is required if the calculated total whole body dose to a theoretical individual at the site boundary is less than 500 mR. If the calculated total dose is greater than 500 mR then the appropriate action depends on whether the release is only a potential occurrence or whether it is actually expected to occur shortly (within 2 hours) or is occurring.
	The evacuation of non-essential personnel (in accordance with EP G-5) may be indicated even if the calculated exposure is considerably less than 500 mR if contamination of vehicles or persons is a possibility.

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ABLO CANYON PO	WER PLANT UNIT NO(S)	1 AND 2	NUMBER EP REVISION 5 DATE 6/1 PAGE 13	R-2 15/84 OF 72
ITLE RELEASE	OF AIRBORNE RADIOACTIVE M	ATERIALS		
	 The program should necessary reports 	provide background to regulatory agenci	data for any es.	
	 The program should of public concern. 	provide the data to	answer questions	
d.	Recommend Additional Pro Public (if required)	otective Measures fo	r Members of the	T
	Table 2 summarizes recomexposure to a passing pl must include the entire been exceeded. A somewh considered to account for	mmended protective and lume. The area where area in which the do hat larger area than or uncertainties.	ctions for e action is taken ose criteria have this should be	
	If protective action is action zones (PAZ) are a pointing in the downwind in this direction and or Evacuate everyone within where the dose criteria	required, determine offected. On Figure d direction. Note the both sides of this this 67.5° sector of is not exceeded.	which protective 1, draw an arrow he 22.5° sectors downwind sector. but to the radius	
	NOTE: The decision to i which area(s) are local government	mplement protective involved is the res agencies.	actions and sponsibility of	1
e.	Conduct appropriate post operations.	-accident cleanup ar	nd re-entry	
f.	Close-out the event with agencies and complete th	a verbal summary to e following written	o offsite reports:	
	1) Plant Problem Repor Procedure C-12).	t (see Nuclear Plant	Administrative	
	2) Written summary to	NRC within 8 hours.		
g.	All records generated by for an exercise or emerg working day to the Assis for review and retention	the utilization of ency shall be forwar tant Plant Manager/S	this procedure ded the next upport Services	

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DIABLO CANYON	POWER PLANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 14 OF 72
TITLE RELEASE	OF AIRBORNE RADIOACTIVE MATER	RIALS	
	 Records generated from non permanent and retain 	n exercises will be sined for a minimum	categorized as of five years.
	 Records generated from categorized as lifetim storage in accordance Retention and Extended Activity Records (AP E 	n actual emergency e me and placed into 1 with procedure "Req d Storage of Operati E-1S1).	vents will be ifetime uirements for on Phase
6. Sut	osequent Actions for a General	Emergency	
a.	Evacuate Non-essential Site	Personnel	
	As soon as the accident has Emergency, order evacuation personnel in accordance wit Evacuation of Non-essential	been classified as of all nonessentia h instructions give Site Personnel.	a General 1 site n in EP G-5,
b.	Evacuate Members of the Pub	lic from the Downwi	nd LPZ
	As soon as the accident has Emergency, notify the San L recommended immediate evacu starting with the downwind the Basic Emergency Plannin standby alert by sounding t issuing a message on the Em	been classified as uis Obispo County Si ation of the LPZ (Pi direction, with the g Zone being placed he Early Warning Sys ergency Broadcast Sy	a General heriff and AZ's 1 and 2) remainder of on stem and ystem.
	If a release is imminent (i occurring, or has occurred, criteria for a General Emer 1R/hr), also recommend shel sector and adjacent sectors basic EPZ (see Figure 1) or dose greater than 500 mR is	.e. within 2 hours) which is comparable gency (Site Boundary tering in the downwi (67.5°) to the bour a farther distance calculated at furth	, or e to the y dose rate of ind affected hdary of the if a total her distances.
с.	Provide periodic meteorolog authorities and, if any rel projections for actual rele	ical assessments to eases are occurring, ases.	offsite , dose
	 Activation of EARS is transmitting dose proj 	the preferred method ections offsite.	for

DIABLO CANYON POWER P	LANT UNIT NO(S)		1 AND 2		NUMBER REVISION DATE PAGE	EP R-2 5 6/15/84 15 OF 72
TITLE RELEASE OF AI	REORNE RADIOA	CTIVE MATE	RIALS			
2)	If EARS is in (EARAUT) or hand calcula to procedure information personnel an assessment in	not availa manual (E ations usi es EP RB-B and asses re availab informatio	ble in eith ARMAN) mode ng appendic through 12 sment guida le. Use Fo n when appr	er the aut , perform es 2 - 6. for addit nce as add orm 69-1026 opriate.	omatic appropriat Refer als ional itional 2 to trans	e o mit
d. Per	form Offsite M	Monitoring				
1)	General					
	A General Em such that so LPZ, such as foodstuffs, monitoring p following pu	mergency re ome offsite s evacuatio may be rec program sho urposes:	elease is o e protectiv on or long- quired. Th ould be est	f sufficie e measures term impou erefore, a ablished fi	nt magnitu beyond th ndment of n offsite or the	de e
	a) Initial identif where p prevent evacuat and/or	lly, the pr fying those personnel e persons f tion criter 5 rem thyr	rogram shou e areas loc evacuation from exceed ria doses o roid. (See	ld be dired ated beyond may be neck ing the red f 500 mrem Table 1.)	cted towar d the LPZ essary to commended whole bod	d Y
	 b) Once an program long-te foodstu where p require 	y immediat shall be rm deconta iffs, which prompt pers ed.	te evacuation set up to o amination on might be o connel evacu	on is accor determine t r impoundme desirable e uation was	mplished, the need for ent of even in are not	the or eas
	NOTE:	These deci local gove current go summarized Guidelines	sions are t ernment agen overnment re i in EP RB-1	the respons ncies. How ecommendati 10, "Protec	sibility of vever, ions are ctive Actio	f
	c) The pro necessa	gram shoul ry reports	d provide to to regulat	background tory agenci	data for a es.	iny
	d) The pro- question	gram shoul ns of publ	d provide t ic concern.	the data to	answer	
	4		ie concern.			

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DIABLO	CANYO	N PO	WER P	LANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 16 05 700
TITLE	RELE	ASE	OF AI	RBORNE RADIOACTIV	E MATERIALS	
		е.	Reco	ommend Additional	Protective Measures	
			Tab expo must exce cons	le 2 summarizes re osure to a passing t include the enti eeded. A somewhat sidered.	ecommended protective plume. The area whe re area in which the larger area than the	actions for ere action is taken dose criteria are is should be
		f.	Cond	duct appropriate prations.	oost-accident cleanup	and reentry
		g.	Clos and	se-out the event w complete the foll	with verbal summary to owing written reports	offsite agencies :
			1)	Plant Problem Re Procedure C-12).	port (see Nuclear Pla	nt Administrative
			2)	Written summary	to NRC within 8 hours	
		h.	All for work for	records generated an exercise or em ing day to the As review and retent	by the utilization o ergency shall be forw sistant Plant Manager ion.	f this procedure arded the next /Support Services
			1)	Records generate non permanent an	d from exercises will d retained for a mini	be categorized as mum of five years.
			2)	Records generate categorized as 1 storage in accord Retention and Ex Activity Records	d from actual emergen ifetime and placed in dance with procedure tended Storage of Ope (AP E-1S1).	cy events will be to lifetime "Requirement for ration Phase
	APPEN	DICE	S			
	1.	Summ Rele	ary o ase D	f Criteria for Cla ata	assifying Emergency B	ased Upon Dose and
	2.	Inst Vent	Moni	ons for Estimating tors RE-14 or RE-2	g Noble Gas Release R 29	ate Using Plant
	3.	Inst Moni	ruction R	ons for Estimating E-24	g Iodine Release Rate	Using Plant Vent

DIABLO	CANY	ON POWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE PAGE	EP R-2 5 6/15/84 17 OF 72					
TITLE	RELEASE OF AIRBORNE RADIOACTIVE MATERIALS								
	4.	Use of Main Stream Line Monitors or RCS Sample Re Steam Generator Tube Rupture Accidents	sults During						
	5.	Summary of Field Monitoring Formulae that are Use Classifying Accidents	ful in						
	6.	Accident Summary Sheets							
171	ATT	ACHMENTS							
	1.	Form 69-10581, "Initial Emergency Notification Fo	rm"						
	2.	Form 69-10262, "Emergency Status Form"							
	3.	Figure 1, "San Luis Obispo County Protective Acti Sections from Plant"	on Zones and						
	4.	Figure 2, "Use of EP R-1 Tables and Appendices"							

PG at	nd E Recommended Initial	TABLE 1 General Public Protect	tiv: Action Criteria	DIABL
Emergency Classification ¹	Release Status ²	Site Boundary Dose ³	Appropriate Recommended 4 Initial Protective Action	O CANYO
A-Unusual Event	A11	N/A	None	LEAS
B-Alert	A11	N/A	None	SE OI
C-Site Area Emergency	A11	<500 mR (Totai W.B.)	None	FAIR
8	B-Potential Release	>500 mR (Total W.B.)	C-Evacuate transients (Montana de Oro Visitors, agricultural workers, etc.) in the low population zone (PAZ's 1 and 2) starting with the affected sector and two adjacent sectors.	T UNIT NO(S) 1 BORNE RADIOACTIV
	C-Imminent Release or D-Release is Occurring		B-Evacuation of the Site, and PAZ 1.	AND 2 VE MATERI
"	E-Release has Occurred but stopped.	"	None	ALS
D-General Emergency	A-No Release or B-Potential Release	N/A	D-Evacuate the site and low population zone (PAZ's 1 and 2) starting with the affected	
			sector and two adjacent sectors. Alert the public in the basic emergency planning zone using the Early Warning System Sirens and EBS Broadcasts.	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 18 OF 72
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lease <u>atus</u> Imminent Release or Release is Occurring or Release has Occurred t stopped	Site Boundary	Dose ³ N/A	Appropriate Recommended 4 Initial Protective Action ⁴ D-(as above) and shelter personnel in the affected sector and two adjacent sectors to the boundary of the Basic EPZ. Specify a further	RELEASE OF A	CANYON POWE
Imminent Release or Release is Occurring or Release has Occurred t stopped		N/A	D-(as above) and shelter personnel in the affected sector and two adjacent sectors to the boundary of the Basic EPZ. Specify a further	LEASE OF A	N POWE
			distance from the plant if a total dose >500 mR is projected at further distances.	IRBORNE RADIC	R PLANT UNIT NO(S)
m 69-10581. m 69-10581. e with EP R-2. m 69-10581.				ACTIVE MATERIALS	1 AND 2
				REVISION 5 DATE 6/15/84 PAGE 19 OF 72	MUMBER EP R-2
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		TABLE 2		TITL	DIAS
	RECOMMENDED PRO	DIECTIVE ACTIONS TO REDUCE WHOLE BODY FROM EXPOSURE TO A GASEOUS PLUME	AND THYROID DOSE	m	BLO CAI
	Projected Dose (rem) to the Population	Recommended Actions ^(a)	Comments	RELEAS	NYON PO
WI	hole Body - Less than $0.5^{(b)}$	No planned protective actions(c).	Previously recommended	E OF	WER
TI	hyroid - less than 5	advisory to seek shelter and await further instruction. Monitor environmental radiation levels.	reconsidered or terminated.	AIRBORNE	PLANT UNIT
WI TH	hole Body - 0.5 to 5 hyroid - 5 to 25	Seek shelter as a minimum. Consider evacuation/unless constraints make it impractical. Monitor environmental radiation levels. Control access to affected areas.	If constraints exist to prevent full-scale evacuation, special consideration should be given for evacuation of children and pregnant women.	RADIOACTIVE	T NO(S)
Wł	hole Body - 5 and above	Conduct mardatory evacuation.	Sheltering is an alternative if	MATER	1 AND
T	hyroid – 25 and above	levels and adjust area for mandatory evacuation based on these levels. Control access to affected areas.	accomplished.	RIALS	2 (
(a	a) These actions are recommen of the incident must take time).	ded for planning purposes. Protecti existing conditions into considerati	ve action decisions at the time on (e.g., weather, plume arrival	PC	RE
(t) The value of 0.5 rem whole	body is based upon guidance from th	e State of California.	GE	UMBER VISI
(c	c) At the time of the inciden with the principle of main	t, officials may implement low-impac itaining radiation exposures as low a	t protective actions in keeping s reasonably achievable (ALARA).	6/15/84 20 OF 72	ON 5 R-2
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1 AND 2 DIABLO CANYON POWER PLANT UNIT NO(S) NUMBER EP P-2 REVISION 5 DATE 6/15/84 PAGE 21 OF 72 RELEASE OF AIRBORN RADIOACTIVE MATERIALS TITLE. APPENDIX 1 SUMMARY OF CRITERIA FOR CLASSIFYING EMERGENCY BASED UPON DOSE AND RELEASE DATA For each classification, the actual definition is given NOTE 1: from EP G-1. If the necessary information is available, this is the best criteria to use. This criteria is summarized in Table A. In addition, however, a set of Derived Criteria are also provided. These are calculated criteria, which are slightly less accurate because of the necessity to make calculational assumptions, but which may be more useful depending on what information is readily available. NOTE 2: In general, derived criteria are expressed in terms of the site boundary atmosphere dilution factor, $(X/Q)_{800}$. This can be obtained from the meteorological computers or from the EARS computer. However, if this information is not readily available, default values of the criteria are given using the FSAR design basis $(X/4)_{ROO}$ = 5.3x10⁻⁴ sec/m³. NOTE 3: The definitions of terms used in the equations are: Q_{NG} = noble gas release rate (Ci/sec) Q₁ = iodine release rate (Ci/sec) Q_{NG} = total curies of noble gas released (Ci) Q₁ = total curies of iodine released (Ci) $X_1 = iodine concentration (\mu Ci/CC or Ci/m³)$ $(X/Q)_{800}$ = centerline atmospheric dilution factor @ 800 m (sec/m³) A. UNUSUAL EVENT 1. Definition Radiological effluent technical specification limits exceeded.

DIABLO CA	NYON PO	WER P	AIRBORNE RADIOACTIVE MATERIA	ALS	NUMBER REVISION DATE PAGE	EP R-2 5 6/15/84 22 OF 72
			APPENDIX 1 (Conti	nued)		
		The bou	technical specification lim dary 800 m or 0.5 miles dos	nits correspond are rates of:	to site	
		a.	Whole body ≥ 0.057 mR/hr.			
		ь.	Thyroid > 0.170 mrem/hr.			
	2.	Der	ved Criteria			
		a.	Noble Gas Release Rate			
			$\hat{Q}_{NG} \ge \frac{6.3 \times 10^{-7}}{(X/Q)_{800}}$			
			Default Value (FSAR X/Q):	Q _{NG} ≥ 0.0012	Ci/sec	1
		b.	Iodine Release Rate			
			$\dot{Q}_{1} \ge \frac{9.2 \times 10^{-11}}{(X/Q)_{800}}$ (Assumed	to be I-131)		
			Default Value (FSAR X/Q):	$0_1 \ge 1.7 \times 10^{-7}$	Ci/sec	1
		с.	Centerline Iodine Concentr	ation @ 800 m		
			$X_{I} > 9.2 \times 10^{-11}$ (Assumed	to be I-131)		
Β.	ALER	T				
	1.	Defi	nition			
		Radi	ological effluents greater i ification limits exceeded.	than 10 times t	technical	
		This	corresponds to the followin dary (800 m or 0.5 miles):	ng dose rates a	at the site	
		a.	Whole body \geq 0.57 mR/hr.			
		b.	Thyroid > 1.70 mrem/hr.			

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DIABLO C	ANYON PO	OWER PLANT UNIT NO(S) 1 AND 2 NUMBER EP P-2 REVISION 5 DATE 6/15/84	
TITLE	RELEASE	E OF AIREORNE RADIOACTIVE MATERIALS PAGE 23 OF	72
		APPENDIX 1 (Continued)	
	2.	Derived Criteria	
		a. Noble Gas Release Rate	
		$Q_{NG} \ge \frac{6.3 \times 10^{-6}}{(X/Q)_{800}}$	
		Default Value (FSAR X/Q): Q _{NG} ≥ 0.012 Ci/sec	1
		b. Iodine Release Rate	
		$Q_{I} \ge \frac{9.2 \times 10^{-10}}{(X/Q)_{800}}$ (Assumed to be I-131)	
		Default Value (FSAR X/Q): $Q_{1} \ge 1.7 \times 10^{-6}$ Ci/sec	
		c. Centerline Iodine Concentration at 800 m	
		$X_{I} \ge 9.2 \times 10^{-10}$ (Assumed to be I-131)	
с.	SITE	AREA EMERGENCY	
	1.	Definition	
		Radiological effluents correspond to greater than 50 mR/hr for 1/2 hour or greater than 500 mR/hr for 2 minutes to the whole body (or five times these levels to the thyroid) at the site boundary (800 m).	
		This can also be interpreted to mean an accident which produces a total dose at the site boundary of \geq 17 mR (whole body) or \geq 85 mrem (thyroid), which is used for comparison of calculations of total dose, for peak (puff) releases.	
	2.	Derived Criteria	
		a. Peak Noble Gas Release Rate (> 2 minutes duration)	
		$\dot{Q}NG \ge 5.6 \times 10^{-3}$	

 $(X/Q)_{800}$ Default Value (FSAR X/Q): $Q_{NG} \ge 10.5$ Ci/sec

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DIABLO CANYON POWER PLANT UNIT NO(5) 1 AND 2	NUMBER EP R-2 REVISION 5
TITLE RELEASE OF AIRBORNE RADIOACTIVE MATERIALS	DATE 6/15/84 PAGE 24 OF 72
APPENDIX 1 (Continued)	
b. Average Noble Gas Release Rate (>	30 minutes duration)
$\dot{Q}_{NG} \ge \frac{5.6 \times 10^{-4}}{(X/\dot{Q})_{800}}$	
Default Value (FSAR X/Q): $Q_{NG} \ge 1$.0 Ci/sec
c. Total Noble Gas Release	
$Q_{NG} \ge \frac{0.68}{(X/Q)_{800}}$	
Default Value (FSAR X/Q): $O_{NG} \ge 12$	280 Curies
d. Feak Iodine Release Rate (<u>></u> 2 minut	tes duration)
$\dot{Q}_{1} \ge \frac{1.35 \times 10^{-6}}{(X/Q)_{800}}$ (Ass	sumed to be I-131)
Default Value (FSAR X/Q): $Q_1 \ge 2.5$	x10 ⁻³ Ci/sec
e. Average Iodine Release Rate (> 30 m	minutes duration)
$\dot{Q}_{1} \ge 1.35 \times 10^{-7}$ (Ass	sumed to be I-131)
(X/Q) ₈₀₀	밖에서 집중 관계에 없다.
Default Value (FSAR X/Q): $\dot{Q}_{I} \ge 2.5$	5x10 ⁻⁴ Ci/sec
f. Total Iodine Release	
$Q_1 \ge \frac{1.65 \times 10^{-4}}{(X/Q)_{800}}$	
Default Value (FSAR X/Q): $O_{I} \ge 0.3$	B Curies
D. GENERAL EMERGENCY	
1. Definition	
Radiological effluents correspond to 1 R rem/hr thyroid at the site boundary.	/hr whole body or 5

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DIABLO CANYON POWER	LANT UNIT NOIS)	ND 2	NUMBER	EP R-2 5
TITLE RELEASE OF	RELEASE OF AIRBORNE RADIOACTIVE MATERIALS			
	APPENDIX 1 (Cont	inued)		
2. Der	ived Criteria			
a.	Noble Gas Release Rate			
	$Q_{NG} \ge \frac{0.011}{(X/Q)_{800}}$			
	Default Value (FSAR X/Q):	Ô _{NG} ≥ 21 Ci/sec		1
b.	Iodine Release Rate			
	$\dot{Q}_{I} \ge \frac{2.7 \times 10^{-6}}{(X/\dot{Q})_{800}}$	(Assumed to be]	-131)	
	Default Value (FSAR X/Q):	$\dot{Q}_1 \ge 0.005$ Ci/sec		ł

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DIABLO CANYON POWER PLANT UNIT NO(S) RELEASE OF AIRBORNE RADIOACTIVE	1 AND 2 MATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 26 OF 72
APPE TA SUMMARY O EMERGENCY CLASS (FROM	NDIX 1 BLE 1 F A RELATED IFICATION CRITERIA EP G-1)	
	Site Boundry (800m d	or 0.5 mile)
	WHOLE BODY	THYROID
Unusual Event	<u>>0.057</u> mR/hr	≥0.170 mR/hr
Alert	<u>></u> 0.57 mR/hr	≥ 1.70 mR/hr
Site Area Emergency	<pre>> 50 mR/hr for 1/2 hour or peak release, > 2 min and either: >500 mR/hr or > 17 mR</pre>	<pre>> 250 mR/hr for 1/2 hour</pre>
General Emergency	l R/hr	5 R/hr

DIABLO CANYON RELEAS	POWER PLANT UNIT NO(S) E OF AIRBORNE RADIOACTI	1 AND 2 IVE MATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 27 OF 72
		APPENDIX 2	
	USING PLANT VENT	MONITORS RE-14 or F	E-29
Performe	d By:	Date	Time
APPLICAB	ILITY		
First ch appendix high ran monitor	bice if noble gas relea is for initial or subs ge monitor. Refer to E for subsequent and conf	se is going out of p equent assessments u P RB-12 for use of t irmatory assessments	lant vent. This sing the low or he mid-range
INSTRUCT	IONS		
1. Dete	ermine Plant Vent Flow	Rate (in cfm) on Aff	ected Unit
а.	Check FR-12 on Unit 2 operable, read flow r	RMS board in contro ate directly off of	l room. If chart.
	F _{vent} =	cfm	
b.	If FR-12 is inoperable number of ventilation fan capacities:	e, determine the flo fans in operation a	w rate using the nd the following
	FHB exhaust fans Aux Bldg exhaust Cont purge exhaus Cont H ₂ purge fan	@ 35750 cfm/fan fans @ 73500 cfm/fa st fans @ 55000 cfm/ n @ 300 cfm/fan	n = cfm fan = cfm = cfm
	Sum Fvent	= cfm	
2. Read Othe Conv (for spac	RE-14 (on Radiation Mo rwise, read RE-29 (on F ert the readings to pla RE-14) or Figure 2 (fo es provided.	onitoring Panel) if Post-Accident Monito ant vent concentrati or RE-29). Summariz	it is on scale. ring Panel). on using Figure 1 e the data in
NOTE	: On Figure 1, assume accidents except a f has been out of the	effective age<1000 fuel handling accide core for at least a	nours for all nt where the fuel month.

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$\frac{\text{RE-14}}{\text{Time}} \xrightarrow{\text{RE-29}} \frac{\text{Time}}{\text{mR/hr.}} \xrightarrow{\text{uCi/cc}} \frac{\text{Time}}{\text{mR/hr.}} \xrightarrow{\text{uCi/cc}} \frac{\text{mR/hr.}}{\text{uCi/cc}}$ $3. \text{Calculate Noble Gas Release Rate}$ $\frac{\text{Regardless of the instrument used, the formula for calculating the noble gas release rate is:} \\ \hat{Q}_{\text{NG}}(\text{Ci/sec}) = (\text{uCi/cc Vent}) \times F_{\text{vent}} (\text{cfm}) \times 4.72 \times 10^{-4} \text{ msc}} \frac{10^{-4}}{\text{msc}} = \frac{\hat{Q}_{\text{NG}}(\text{Ci/sec})}{\text{msc}} \times \frac{(4.72 \times 10^{-4})}{(4.72 \times 10^{-4})} = \frac{\hat{Q}_{\text{NG}}(\text{Ci/sec})}{(4.72 \times 10^{-4})} = \frac{\hat{Q}_{\text{NG}}(\text{Ci/sec})}{($	Ig
3. Calculate Noble Gas Release Rate Regardless of the instrument used, the formula for calculating the noble gas release rate is: $\dot{Q}_{NG}(Ci/sec) = (uCi/cc \ Vent) \times F_{vent} \ (cfm) \times 4.72 \times 10^{-4}$ INSTR. TIME $(uCi/cc) \times \frac{(F_{vent})}{(4.72 \times 10^{-4})} = \frac{\dot{Q}_{NG} \ (Ci/sec)}{RE-}$	ŋg
Regardless of the instrument used, the formula for calculating the noble gas release rate is: $\dot{Q}_{NG}(Ci/sec) = (uCi/cc Vent) \times F_{vent} (cfm) \times 4.72 \times 10^{-1}$ <u>INSTR.</u> <u>TIME</u> (<u>uCi/cc</u>) $\times \frac{(F_{vent})}{(4.72 \times 10^{-4})} = \frac{\dot{Q}_{NG}(Ci/sec)}{NG(Ci/sec)}$	ng
$\dot{Q}_{NG}(Ci/sec) = (uCi/cc Vent) \times F_{vent} (cfm) \times 4.72 \times 10^{-1}$ INSTR. <u>TIME</u> (uCi/cc) $\times \frac{(F_{vent})}{(4.72 \times 10^{-4})} = \frac{\dot{Q}_{NG}(Ci/sec}{VG}$ RE-	
INSTR. <u>TIME</u> (μ Ci/cc) × (F _{vent}) × (4.72 × 10 ⁻⁴) = Q _{NG} (Ci/sec RE- × (4.72 × 10 ⁻⁴) =	
RE- $x (4.72 \times 10^{-4}) =$.1
	-
$RE-_ x x (4.72 \times 10^{-4}) =$	-
$x = x$ $(4.72 \times 10^{-4}) =$	_
RE X X (4.72 × 10 ⁻⁴) =	
$\frac{x}{x} = \frac{x}{(4.72 \times 10^{-4})} = \frac{x}{(4.72 \times 10^{-4})} = \frac{x}{(4.72 \times 10^{-4})}$	-
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	-
$RE x (4.72 \times 10^{-4}) =$	-
$x = x = x = x = (4.72 \times 10^{-4}) = $	_
DATEBY	

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Net Gross Gamma Monitor Response (mR/hr)

ABLO CANYON	POWER PLANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5 DATE 6/15/84
TLE RELEAS	E OF AIRBORNE RADIOAC	TIVE MATERIALS	PAGE 31 OF 72
		APPENDIX 3	
	INSTRUCTIONS FOR USING PLA	ESTIMATING JODINE REL NT VENT MONITOR RE-24	EASE RATE
Performed	5 By	Date	Time
APPLICABL	ILITY		
high rang estimatin the resul instrumen	e iodine monitor. A ig high release rates ts for analysis of th its.	technique is given f using RE-24 for use he cartridge from RE-	or initially prior to obtaining 24 to other
1. Dete	rmine Ratio of Plant	Vent Flow Rate to Sa	mpler Flow Rate
a.	Sampler Flow Rate		
	Read at instrument. 1.55 cfm.	Otherwise assume th	e normal setting of
	F _{samp} =	cfm	
b.	Plant Vent Flow Rate		
	 Check FR-12 on cperable, read 	Unit 2 RMS board in flow rate directly o	control room. If ff of chart.
	F _{vent} =	cfm	
	 If FR-12 is ino the number of v following fan c 	perable, determine t entilation fans in o apacities:	ne flow rate using peration and the
	FHB exhaust fan Aux Bldg exhaus Cont purge exha Cont H ₂ purge f	s @ 35750 cfm/fan t fans @ 73500 cfm/f ust fans @ 55000 cfm, an @ 300 cfm/fan	an = cfm (fan = cfm = cfm
	Sum Fvent	× c	fm

DIABLO CAN	YON POY	VER PLANT UNIT NO(S) 1 AND 2	NUMBER E REVISION 5	P R-2
TITLE	RELEASI	E OF AIRBORNE RADIOACTIVE MATERIALS	DATE E PAGE 3	/15/84 2 OF 72
		APPENDIX 3 (Continued)	Teanstan - State St	
	с.	Calculate Flow Rate Ratio		
		FRR = Fvent + Fsamp = + =		
٤.	Obta	in Reading On Instrument and Calculate Relea	se Rate	
	a.	Turn the toggle switch on the front of the μ Ci/sec(x10 ⁻¹¹) position.	instrument to th	e
	b.	Turn the SCALE FACTOR switch to the "1000" switch is located inside the door on the loc the instrument. Record the scale factor in paragraph 2.d. below.	position. This wer front part o the blank in	f
	c.	To allow for instrument response time wait a minute and then read the chart. Enter this blank in paragraph 2.d. below. The chart re number between 1 and 1000. If the instrumer on scale, I-131 is not a significant contrib accident.	at least one (1) reading in the eading is a nt does not read bution to the	
	d.	To account for iodine plateout, a plateout f to be used.	factor of 1.1* is	s
	е.	Calculate the release rate using the formula	1	
		O ₁ (Ci/sec)=(Chart Reading)x(scale Factor)x(Factor)x(FRR)x 10 ⁻¹⁷ .	Plateout	
	TIME	<pre>scale (Reading)x(Factor)x(Plateout)x(FRR)x(10⁻¹⁷</pre>	$\dot{v} = \dot{v}_{I}$ (Ci/sec	:)
		$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		
(*Tr size resu	ansmise the points in	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	micron particle is 0.9, which of emergency	

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DIABLO C	CANYO	ON PO	WER PLANT UNIT NO(S) 1 AND 2	NUMBER EP R-2 REVISION 5
TITLE	RE	ELEAS	E OF AIRBORNE RADIOACTIVE MATERIALS	PAGE 33 OF 72
			APPENDIX 3 (Continued)	
	3.	Cald	culating Release Rate If Cartridge is anal	yzed in the Lab
		Some room I-13	etimes it is desirable to take the cartrid n. If so, have the technician report the B1 contained on the cartridge.	ge to the counting total µCi of I or
		a)	Activity on Cartridge (A _{cart}) =	_uCi (circle I or
		b)	Estimate the time over which the release seconds).	has persisted (in
			At _{RELEASE} =(SEC)	
		c)	Calculate the average release rate using	the equation:
			\dot{Q}_{I} (Ci/sec) = [A _{cart} (µCi)] x [1.1*] x(A	FRR) x 10 ⁻⁶
			[At _{RELEASE} (Sec)]	
			$\frac{=() \times (1.1) \times () \times 10^{-6}}{()} = $	Ci/sec
4	4.	Calc	ulating Release Rate If RE-24 is Inaccessi	ble
		NOTE	: This method is very approximate and is technique only.	an interim
		а.	Take a gamma dose rate measuring instrume RE-24 as close as possible, <u>being careful</u> personnel exposure limits.	nt and approach not to exceed
		b.	Get as close to RE-24 as you can and take (in R/hr) and also estimate the distance from RE-24.	a Radowl reading (in meters) you are
			Dose Rate (DR) = Distance to RE-24 (d) =	_R/hr _m
		c.	Estimate the time over which the release seconds). $\Delta t_{RELEASE}$ = sec	has persisted (in
	lodi size	ine p	lateout correction factor of 1.1 based on	0.3 micron particle

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DIABLO CANYON POWER PLANT UNIT NO(S)	1 AND 2	NUMBER REVISIO DATE PAGE	EP P-2 N 5 6/15/84 35 OF 72
<u>A</u>	PPENDIX 4		
Use of Main Steam Line Monitors or RC Tube Rupture Accidents.	CS Sample Result	s During Steam Gen	erator
PERFORMED BY	DATE	TIME	
AFPLICABILITY			

One of the most difficult accidents to estimate the release rate for is a S/G Tube Rupture. This is due to uncertainties in primary to secondary leak rate and in steam release rate to the atmosphere. The release pathway for a secondary system release will largely depend on identifying the affected Steam Generator and whether or not it's associated Main Steam Isolation Valve (MSIV) has been closed. When the MSIV is open and the condenser is used as the principal heat sink, the condenser air ejectors release via the Plant Vent, which is a monitored release point. If the Condenser is unavailable or if the MSIV is closed, steam flow from the affected Steam Generator should be assumed to be released via atmospheric steam dumps. The instantaneous release rate (Q) may be calculated below using the radioactivity concentration of the primary or secondary system.

INSTRUCTIONS

- Determine the effluent stream concentration, C(uCi/cc) by one of the two following methods:
 - 1.A. Main Steam Line Monitors (RE-71, 72, 73 & 74). This is the preferred method, but it is possible that radioactivity levels in secondary system steam (or water if the steam-line is flooded) may be too low for Monitors RE-71 74 to come on-scale. Otherwise, enter appropriate data below and perform the indicated calculations:

TIME	Main St	eam Line M	onitor Cha	nnel*	
ΒΥ	RE-71	RE-72	RE-73	RE-74	
(1) Reading					
(CPM)					
(2) Total Conc (^C Total) From Figure A**					
*NUTE: Re-71 corresponds to S RE-73 to S/G-3, and RE **Use emergency (Initial Relea	team Gener -74 to S/G se Curve)	ator (S/G) -4. values.	number 1,	RE-72 to	5/G-2,
DC0240 25V					

DIABLO CANYON POWER PLANT UNIT NO(5) 1 AND 2	NUMBER EP R-2 REVISION 5 DATE 6/15/84
RELEASE OF AIRBORNE RADIOACTIVE MATERIALS	PAGE 30 UF 7
APPENDIX 4 (Continued)	
To calculate the fraction of total steam line activity Gases, Iodines, and Particulates, some assumptions and performed. If the FSAR design basis steam generator f then the fraction of the total activity in the steam follows:	v attributable to Noble d calculations have to be tube rupture is assumed, line can be broken down as
$C_{NOB GAS} = C_{TOTAL} \times 0.9990(F_{NG}^{1})$	
$C_{10DINE} = C_{TOTAL} \times 0.000195(F_{I}^{1}) - DEFAULT$	VALUES
$C_{PART} = C_{TOTAL} \times 0.000005(F_{PART}^{1})$	
However, these fractions should be adjusted based on r analyses, and partitioning factors. To accomplish this relative concentrations of noble gases, iodines, and p coolant as described below:	reactor coolant sample is, first determine the particulates in the reactor
Calculate Fractional Reactor Coolant Activity	
F _{NG} = <u>(Total Noble Gas Activity of Reactor Coolan</u> (Total Reactor Coolant Activity)	<u></u>
(Total Reactor Coolant Activity)	-
F _{PART} = <u>(Total Particulate Activity of Reactor Co</u> (Total Reactor Coolant Activity)	<u></u>
Calculate Fractional Steam-Line Activity	
$F^{1}_{NG} = \frac{(^{r}_{NG})(^{PF}_{NG})}{[(F_{NG})(^{PF}_{NG}) + (F_{I})(^{PF}_{I}) + (F_{PART})(^{PF}_{PART})}$	l
$F^{1}_{I} = \frac{(F_{I})(PF_{I})}{PF_{I}}$	
$(F_{NG})(PF_{NG}) + (F_{I})(PF_{I}) + (F_{PART})(PF_{PART})$	1
$PART = \frac{(PART)(PART)}{L(F_{NG})(PF_{NG}) = (F_{I})(PF_{I}) + (F_{PART})(PF_{PART})}$	Ţ

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DIABLO	RELEASE OF AIRBORNE	IO(S) RADIOACTIVE	1 AND 2 MATERIALS	2	NUMBER REVISION DATE PAGE	EP R-2 5 6/15/84 37 OF 72
	VALUES OF ST	APPENDIX TEAM GENERA Steam Gener	4 (Continue TOR PF (FAR ator Water	d) TIONING FACT Level	OR)	
	Radionuclide Group	Empty	Normal	Flooded		
	Noble Gases (PF _{NG})	1.0	1.0	1.0		
	Iodines (PF ₁)	0.1	0.01	1.0		
	Particulates (PF _{PART})	0.01	0.01	1.0		
	Calculate Steam-Line Co	ncentration	<u>1</u>			
	$C_{NOB GAS} = C_{TOTAL} \times F^{1}_{N}$	G =		LUCi cc		
	C _{IODINE} = C _{TOTAL} × F ¹ _I	-		UCi cc		
	$C_{PARTICULATES} = C_{TOTAL}$ Proceed to Section 2.	x F ¹ part =		<u></u>	i C	
1.B.	Steam line activity can activity. This method but it can provide a co concentration. Calculate Fractional Res	be estimat is not as p nservative actor Coola	ed using ar referable a methodology nt Activity	n analysis o as using RE- v for calcula	f reactor co 71, 72, 73, ating steam	polant or 74, line
	$F_{NG} = \frac{(Total Noble Gas)}{(Total Real}$	Activity of ctor Coolan	Reactor Co t Activity)	polant) = _		-
	$F_1 = \frac{\text{(Total Iodine Act)}}{\text{(Total React)}}$	ivity of Re or Coolant	actor Coola Activity)	<u>ent</u> =		
	F _{PART} = (Total Particula (Total Real	ate Activit actor Coola	y of Reacto nt Activity	r Coolant)		_

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CIABLO CANYON POIVER PLANT UNIT NO(S) 1 AND 2 TITLE RELEASE OF AIRBORNE RADIOACTIVE MATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 38 OF 7
$\frac{APPENDIX \ 4 \ (Continued)}{Calculate \ Fractional \ Steam-Line \ Activity}$ $F^{1}NG = \frac{(F_{NG})(PF_{NG})}{[(F_{NG})(PF_{NG}) + (F_{I})(PF_{I}) + (F_{PART})(PF_{PART})]}$ $F^{1}I = \frac{(F_{I})(PF_{I})}{[(F_{NG})(PF_{NG}) + (F_{I})(PF_{I}) + (F_{PART})(PF_{PART})]}$	
$F^{1}_{PART} = \frac{(F_{PART})(PF_{PART})}{[(F_{NG})(PF_{NG}) + (F_{I})(PF_{I}) + (F_{PART})(PF_{PART})]}$ $PF \text{ Values are the same as provided in section 1A.}$ $\underline{Calculate Steam-Line Concentration} \text{ (Use if Steam Generator)}$	is <u>not</u> flooded)
$C_{\text{NOB GAS}} = (\text{Total reactor coolant activity}) \times F_{\text{NG}}^1 \times 0.056*$ $C_{\text{IODINES}} = (\text{Total reactor coolant activity}) \times F_{\text{I}}^1 \times 0.056*$	* = <u>UCi</u> cc = <u>uCi</u>
C _{PARTICULATES} = (Total reactor coolant activity) × F ¹ _{PART} ×	$(0.056^* = \frac{\mu Ci}{cc})$
$C_{NOB GAS} = (Total reactor coolant activity) x F^{1}_{NG} =$	<u>is</u> flooded) <u>uCi</u>
$C_{IODINES} = (Total reactor coolant activity) \times F_{I}^{1} = $	сс <u>µСі</u>
C _{PARTICULATES} = (Total reactor coolant activity) x F ¹ _{PART}	= <u></u> <u>uCi</u> cc
 Once the radioactive steam or water concentration is d steam-line using either section 1A or 1B, the release affected steam generator can be calculated in three di are described in this section. If the steam generator proceed directly to section 2C. 	etermined in the rate from the fferent ways. They is flooded (solid)
*Factor to account for density differences between steam and approximately 558°F and 1115 (psia). This corresponds to the setpoint for the safety valves. This value will overestimate of radioactive material in steam for any lower pressure and	d water, at he highest lift te the concentration

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DIABLO CANYO	LEASE OF AIRBORNE RADIOACTIVE MATERIALS	NUMBER REVISION DATE PAGE	EP R-2 5 6/15/84 39 OF 72
	APPENDIX 4 (Continued)		
2A.	Steam Flow Rate Monitors		
	Each steam line at DCPP has a flow rate monitor w providing steam flow in pounds per hr (lbs/hr) an on-scale if any steam line relief valves are open release from the operators for the appropriate ch 542).	hich is capat d which will . Determine annel (512, 5	ble of read this 522, 532,
	FR = (lbs/hr)		
	Release Rates for noble gases, iodines, and parti calculated as:	culates can t	then be
	$Q_{NG} = FR \frac{1bs}{hr} \times C_{NOB} GAS \frac{uCi}{cc} \times 3.1 \times 10^{-6*} =$		<u>Ci</u> sec
	$\dot{Q}_{\text{IODINE}} = FR \frac{1bs}{hr} \times C_{\text{IODINE}} \frac{\mu Ci}{cc} \times 3.1 \times 10^{-1}$	6 =	<u>Ci</u> sec
	$Q_{PARTICULATES} = FR \frac{1bs}{hr} \times C_{PARTICULATE} \frac{\mu Ci}{cc}$	× 3.1 × 10 ⁻⁶	<u>Ci</u> sec
*Factor t volume of	o convert lbs/hr to cc/sec and µCi/cc to Ci/sec ba steam.	sed on specif	ic
2B.	Operation of Relief and/or Safety Valves		

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Each steam line has six relief valves. Determine which valves are open and total the relief capacity of the open valves.

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DIABLO CANYON POWER PLANT L	I AND 2	NUMBER EP R-2 REVISION 5 DATE 6/15/84
TITLE RELEASE OF AIRBOR	NE RADIOACTIVE MATERIALS	PAGE 40 OF 72
<u>Valve</u>	APPENDIX 4 (Continued) Relief Capacity (If Open) in (1b	s/hr)
10% Steam Dump	4.0×10^{5}	
#1 Safety	8.5 x 10 ⁵	
#2 Safety	8.5 x 10 ⁵	
#3 Safety	8.5 × 10 ⁵	
#4 Safety	8.5 x 10 ⁵	1
#5 Safety	8.5 x 10 ⁵	
Total relief fr	om open valves = FR =(1bs	/hr)
$Q_{NG} = FR \frac{1bs}{hr} x$	$C_{\text{NOB GAS}} = \frac{\mu Ci}{cc} \times 3.1 \times 10^{-6} =$	<u>Ct</u> sec
Q _{IODINE} = FR	$\frac{1\text{bs}}{\text{hr}} \times C_{\text{IODINE}} \qquad \frac{\mu \text{Ci}}{cc} \times 3.1 \times 10^{-1}$	6 = <u>Ci</u> sec
Q _{particulates} =	FR <u>1bs</u> × C _{PARTICULATE} <u>uCi</u> br	$x 3.1 \times 10^{-6} = \frac{Ci}{sec}$
*Factor to convert lbs/hr steam.	to cc/sec and µCi/cc. Based on t	he specific volume of
2C. Primary to Seco	ndary Leak Rate	
Atmospheric rel secondary leak is not possible is 600 gpm.	ease of steam can be estimated if rate is known. If direct determina , the default value for a steam gen	the primary to ation of this value nerator tube rupture
FR =	(gpm)	
Calculate Equiv flooded)	alent Steam Flow (Use if Steam ven	erator is not
$FR^{1} = FR \times 1.13$	$x \ 10^{3*} = \frac{cc}{sec}$	
*Factor to convert gpm (w	ater) to cc/sec (steam)	
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DIABLO CANYON POWER PLANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5 DATE 6/15/84
TITLE RELEASE OF AIRBORNE RADIOACTIV	E MATERIALS	
APPENDIX	4 (Continued)	
Calculate Equivalent Water	Flow (Use if Steam C	Generator is flooded)
FR ¹ = FR x 63.08** =	cc sec	
$\dot{Q}_{NG} = FR^1 \frac{cc}{sec} \times C_{NOB} GAS$	<u>vCi</u> x 10 ⁻⁶ =	<u>Ci</u> sec
$\hat{Q}_{10DINE} = FR^{1} \frac{cc}{sec} \times C_{10DI}$	NE <u>uCi</u> x 1 x 10 ⁻ cc	6 = <u>Ci</u> sec
QPARTICULATE = FR1 CC X	CPARTICULATE UCI	$1 \times 10^{-6} = \frac{Ci}{sec}$



DIABLO CANYON POWER PLANT UNIT NOIS) 1 AND 2	NUMBER EP R-2 REVISION 5
TITLE RELEASE OF AIRBORNE RADIOACTIVE MATERIALS	DATE 6/15/84 PAGE 43 OF 72
APPENDIX 5	
SUMMARY OF FIELD MONITORING FORMULAE TH ARE USEFUL IN CLASSIFYING ACCIDENTS	<u>AT</u>
 Relationship Between Whole Body Dose Rate and Nobl Rate 	e Gas Release
If a whole body dose rate measurement is taken in it can be related to the release rate using the eq	the environment, uation:
$DR_{WB,L} = 9 \times 10^5 \times E_Y \times QNG \times (X/Q)_L$	
Where: DR _{WB,L} = Whole body dose rate at location (mR/hr.)	
E γ = average gamma energy (mev) (See F (default value - 0.1 mev)	igure A) [
<u>NOTE</u> : Effective age is the time since fission existed in equilibrium in the reactor effective age given in the appropriate summary sheet to the time since the re shutdown to use Figure A. If only the reactor shutdown is used, or if the de used, specify this when giving results	on products core. Add the e accident eactor was e time since efault value is
Q _{NG} = noble gas release rate (Ci/sec)	
$(X/Q)_{L}$ = dilution factor at downwind location	on L
NOTE: This equation can also be used to calculate rate if the release rate is known.	downwind dose
2. Relationship Between Thyroid Dose Rate and Iodine C	oncentration
Assuming all iodine is I-131:	
$DR_{THY,L} = 1.85 \times 10^6 [X_{131}]_L$	
Where: DR _{THY} ,L = Thyroid dose rate at location L (Rem/hr).	
$[X_{131}]_L = I-131$ Concentration at Location or Ci/m ³)	L (µCi/cc

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DIABLO CA	NYON POWER PLANT UNIT NO	D(S) 1 AND 2 10ACTIVE MATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 44 OF 72
	<u>Al</u>	PPENDIX 5 (Continued)	1
3.	Relationship Between 1	Thyroid Dose Rate and Iodine H	Release Rate
	Assuming all iodine is	s I-131:	
	$DR_{THY,L} = (1.$.85 x 10 ⁶) $(\dot{Q}_{1}) (X/\dot{Q})_{1}$	
	Where: DR _{THY} ,L = Thyr (Rem	roid dose rate at location L n/hr).	
	₫ _I = iodi	ine release rate (Ci/sec)	
	$(X/\dot{Q})_{L} = dilu$	tion factor at location L (se	ec/m³)
4.	Extrapolation of Dose Locations	Rates, Doses or Concentration	ns to Other
	If a dose or dose rate environment, it may be respective (X/Q) value	e value is available at one lo e extrapolated to another loca es are known.	ocation in the ation if the
	$(DR)_{A} = \frac{(\dot{x}/Q)_{A} (D)_{A}}{(x/\dot{Q})_{B}}$	B B	
	or		
	$(D)_{A} = \frac{(\dot{x}/Q)_{A}}{(x/\dot{Q})_{B}}$	D) _B	
	or		
	$x_{A} = \frac{(x/\dot{Q})_{A} x_{B}}{(x/\dot{Q})_{B}}$		
	Where:		
	DR = dose rate (µ	R/hr, mR/hr, R/hr)	
	D = dose (µR, mR	, R)	
	X = concentration	n (µCi/cc or Ci/m ³)	
	A,3 = locations A	and B	
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DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2		NUMBER REVISION DATE	EP R-2 5 6/15/84
RELEASE OF AIRBORNE RADIOACTIVE MATERIALS		PAGE	46 OF 72
APPENDIX 6			
ACCIDENT SUMMARY SHE	ETS		
both the "design basis" and "expected" case a assumed in the FSAR analyses. The sheets can actual measurements with assumed numbers from help evaluate how things are going in relation can be used as a source of data to supply un calculations which are performed at the time	variables which n be used to co m the FSAR, in on to prediction available number of the accider	h were ompare order to ons, or t ers in ht.	hey
Two sets of data are included. The "design the be highly conservative, where every variable condition. The "expected" case is the best of what might actually occur. When FSAR values calculations or predictions at the time of the basis" values can be used to provide a quick as soon as data becomes available which tends the other, the one which best agrees with the	basis" case is is at a worst- estimated predi are used to man be accident, the upper limit re s to confirm or e data should b	expected case iction of ake "design esult, but ne case on be used.	to n t
The accident classifications identified in th on the activity releases. Other emergency pr different classifications which are based on	nis attachment rocedures may h the initiating	are based have g event.	t

The summary sheets provided are:

Α.	1A MAJOR LOCA
Β.	1B MAJOR STEAM LINE BREAK
С.	1C MAJOR FEEDWATER LINE BREAK
D.	1D BLACKOUT (OR PLANT COOLDOWN WITH ATMOSPHERIC DUMP)
Ε.	1E SMALL LOCA
F.	1F TUBE RUPTURE
G.	1G LOCKED ROTOR
Η.	1H FUEL HANDLING ACCIDENT IN FUEL HANDLING BUILDING
1.	11 FUEL HANDLING ACCIDENT IN CONTAINMENT
J.	1J ROD EJECTION ACCIDENT
Κ.	1K GAS DECAY TANK RUPTURE
٤.	1L LIQUID HOLDUP TANK RUPTURE
Μ.	1M VCT RUPTURE

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DIABLO	CANYON	POW	ER PLANT UNIT NO(S)	1 AND 2		NUMBER REVISION DATE PAGE	EP R-2 5 6/15/84
TITLE	REL	EASE	OF AIRBORNE RADIOACTIV	E MATERIALS			47 01 71
			SUMMA MA	RY SHEET 1A			
			PARAMETER	FSAR DBA	FSAR EXPECTE	D ACTUA	L
	1.	Tot	al Release to Contain- t Free Volume, Ci				
		а.	Xe-133	2.03×10 ⁸	1.36×10 ⁶		
		b.	Other Noble Gases	5.73×10 ⁸	4.27×10 ⁵		
		с.	1-131	2.21×107	1.82×10 ⁵		
		d.	Other Iodine	1.90×10 ⁸	2.73×10 ⁵		
		e.	Effective Age of Mixture (hr)	0	20		
		f.	Release Assumption	100% of core N.G., 25% of core iodines	100% of g N.G., 25% gap iodin	ap of es	
	2.	Con Eff	tainment Spray ectiveness				
		à.	Removal half-life (hrs)	0.022	0.0075		
		b.	Number of operable spray pumps	1	2		
:	3.	Cont (%/0	tainment Leak Rate day)	0.1 for 1st day, 0.05 after 1st day	0.05 for day, 0.02 after 1st day	lst 5	

SUMMARY SHEET 1A (Continued) MAJOR LOCA 4. Total Release to Environs, First 2 Hours, Ci . a. Xe-133 16,840 56 b. Other Noble Gases 25,930 21 c. I-131 191 0.05 d. Other Noble Gases 25,930 21 c. I-131 191 0.05 d. Other Iodine 1,325 0.08 e. Effective Age of 1 40 Mixture f. Release Mechanism Containment Leakage Containment Leakage 5. (x/\dot{Q}) CL (sec/m ³) a. 800m (site boundary) 5.29x10 ⁻⁴ 5.29x10 ⁻⁵ b. 10000m (6 mi. LP2) 2.20x20 ⁻⁵ 2.20x10 ⁻⁶ 6. Whole Body Dose Results a. Total 800m dose for 1st two hours (mR) 5.600 0.365 b. Total 10000m dose for 567 0.06 30 days (mR) 1.25 7. Thyroid Dose Results a. Total 800m dose for 95,900 1.25 1. Total 10000m dose for 17,670 0.9 30 days (mR)	RELE	POWER PLANT UNIT NO	ADIOACTIVE MATERIALS	NUME REV DATE PAGE	ER EP R-2 ISION 5 6/15/84 48 OF 7
 4. Total Release to Environs, First 2 Hours, Gi a. Xe-133 16,840 56 b. Other Noble Gases 25,930 21 c. 1-131 191 0.05 d. Other Iodine 1,325 0.08 e. Effective Age of Mixture f. Release Mechanism Containment Leakage 5. (x/Q) CL (sec/m³) a. 800m (site boundary) 5.29x10⁻⁴ 5.29x10⁻⁵ b. 10000m (6 mi. LPZ) 2.20x20⁻⁵ 2.20x10⁻⁶ 6. Whole Body Dose Results a. Total 800m dose for 30 days (mR) 5. Total 10000m dose for 30 days (mR) b. Total 10000m dose for 1 two hours (mR) b. Total 800m dose for 1 two hours (mR) c. Total 800m dose for 1 two hours (mR) c. Total 10000m dose for 30 days (mR) 		<u>SU</u>	MMARY SHEET 1A (Conti MAJOR LOCA	nued)	
a. $Xe-133$ 16,84056b. Other Noble Gases25,93021c. I-1311910.05d. Other Iodine1,3250.08e. Effective Age of Mixture140f. Release MechanismContainment LeakageContainment Leakage5. (x/Q) CL (sec/m ³) a. 800m (site boundary)5.29x10 ⁻⁴ 5.29x10 ⁻⁵ b. 10000m (6 mi. LPZ)2.20x20 ⁻⁵ 2.20x10 ⁻⁶ 6. Whole Body Dose Results a. Total 800m dose for 30 days (mR)5670.067. Thyroid Dose Results a. Total 800m dose for 1st two hours (mR)5670.93b. Total 10000m dose for 1st two hours (mR)95,9001.25b. Total 10000m dose for 30 days (mR)95,9001.25	4.	Total Release to Environs, First 2 Ci	2 Hours,		
b. Other Noble Gases25,93021c. I-1311910.05d. Other Jodine1,3250.08e. Effective Age of Mixture140f. Release MechanismContainment LeakageContainment Leakage5. (x/Q) CL (sec/m ³) a. 800m (site boundary)5.29x10 ⁻⁴ 5.29x10 ⁻⁵ b. 10000m (6 mi. LPZ)2.20x20 ⁻⁵ 2.20x10 ⁻⁶ 6. Whole Body Dose Results a. Total 800m dose for Jst two hours (mR)5.6000.3657. Thyroid Dose Results30 days (mR)5.9001.25b. Total 10000m dose for Ist two hours (mR)95,9001.25b. Total 10000m dose for Jst two hours (mR)0.90.9		a. Xe-133	16,840	56	
c. I-131 191 0.05 d. Other Iodine 1,325 0.08 e. Effective Age of Mixture 1 40 f. Release Mechanism Containment Leakage Containment Leakage 5. (x/Q) CL (sec/m ³) 6 S.29x10 ⁻¹⁴ S.29x10 ⁻⁵ b. 10000m (6 mi. LPZ) 2.20x20 ⁻⁵ 2.20x10 ⁻⁶ 6. Whole Body Dose Results 0 0.365 a. Total 800m dose for S.600 0.365 b. Total 10000m dose for S67 0.06 7. Thyroid Dose Results 0 1.25 a. Total 800m dose for S5,900 1.25 b. Total 800m dose for 95,900 0.9 30 days (mR) 0.9 0.9		b. Other Noble (Gases 25,930	21	
d. Other Iodine $1,325$ 0.08 e. Effective Age of Mixture140f. Release MechanismContainment LeakageContainment Leakage5. (x/Q) CL (sec/m ³)3. 800m (site boundary) 5.29×10^{-4} 5.29×10^{-5} b. 10000m (6 mi. LPZ) 2.20×20^{-5} 2.20×10^{-6} 6. Whole Body Dose Results3. Total 800m dose for 1st two hours (mR) $5,600$ 0.365 7. Thyroid Dose Results3. Total 10000m dose for 1st two hours (mR) 567 0.06 7. Thyroid Dose Results3. Total 800m dose for 1st two hours (mR) $5,900$ 1.25 6. Total 10000m dose for 1st two hours (mR) $95,900$ 1.25		c. I-131	191	0.05	
e. Effective Age of 1 40 f. Release Mechanism Containment Leakage Containment Leakage Containment Leakage 5. (x/\dot{Q}) CL (sec/m ³) a. 800m (site boundary) 5.29x10 ⁻⁴ 5.29x10 ⁻⁵ b. 10000m (6 mi. LPZ) 2.20x20 ⁻⁵ 2.20x10 ⁻⁶ 6. Whole Body Dose Results a. Total 800m dose for 5,600 0.365 1st two hours (mR) b. Total 10000m dose for 567 0.06 7. Thyroid Dose Results a. Total 800m dose for 95,900 1.25 1st two hours (mR) b. Total 10000m dose for 17,670 0.9		d. Other Iodine	1,325	0.08	
f. Release MechanismContainment LeakageContainment Leakage5. (x/\dot{Q}) CL (sec/m ³)a. 800m (site boundary)5.29x10 ⁻⁴ 5.29x10 ⁻⁵ b. 10000m (6 mi. LPZ)2.20x20 ⁻⁵ 2.20x10 ⁻⁶ 6. Whole Body Dose Resultsa. Total 800m dose for 1st two hours (mR)b. Total 10000m dose for 30 days (mR)7. Thyroid Dose Resultsa. Total 800m dose for 30 days (mR)b. Total 10000m dose for 1st two hours (mR)		e. Effective Age Mixture	of 1	40	
 5. (x/Q) CL (sec/m³) a. 800m (site boundary) 5.29x10⁻⁴ 5.29x10⁻⁵ b. 10000m (6 mi. LPZ) 2.20x20⁻⁵ 2.20x10⁻⁶ 6. Whole Body Dose Results a. Total 800m dose for 5,600 b. Total 10000m dose for 567 c. Thyroid Dose Results a. Total 800m dose for 95,900 c. Total 800m dose for 95,900 c. Total 10000m dose for 17,670 b. Total 10000m dose for 17,670 c. Total 10000m dose for 17,670 		f. Release Mecha	inism Containmen Leakage	t Containment Leakage	
 a. 800m (site boundary) 5.29x10⁻⁴ 5.29x10⁻⁵ b. 10000m (6 mi. LPZ) 2.20x20⁻⁵ 2.20x10⁻⁶ 6. Whole Body Dose Results a. Total 800m dose for 5,600 b. Total 10000m dose for 567 c. Thyroid Dose Results a. Total 800m dose for 95,900 c. Total 800m dose for 95,900 c. Total 10000m dose for 17,670 b. Total 10000m dose for 17,670 c. Total 10000m dose for 17,670 	5.	(χ/Q) CL (sec/m ³)			
 b. 10000m (6 mi. LPZ) 2.20x20⁻⁵ 2.20x10⁻⁶ 6. Whole Body Dose Results a. Total 800m dose for 5,600 b. Total 10000m dose for 567 c. Total 10000m dose for 567 c. Total 0000m dose for 95,900 c. Total 800m dose for 95,900 c. Total 10000m dose for 17,670 c. Total 10000m dose for 17,670 c. Total 10000m dose for 17,670 		a. 800m (site bo	oundary) 5.29x10 ⁻⁴	5.29×10 ⁻⁵	
 6. Whole Body Dose Results a. Total 800m dose for 5,600 b. Total 10000m dose for 567 c. Total 10000m dose for 567 c. Total 10000m dose for 95,900 c. Total 800m dose for 95,900 c. Total 800m dose for 17,670 c. Total 10000m dose for 17,670 c. Total 10000m dose for 17,670 c. Total 10000m dose for 17,670 		b. 10000m (6 mi.	LPZ) 2.20×20 ⁻⁵	2.20×10 ⁻⁶	
 a. Total 800m dose for 5,600 0.365 b. Total 10000m dose for 567 0.06 c. Total 1000m dose for 567 0.06 days (mR) 7. Thyroid Dose Results a. Total 800m dose for 95,900 1.25 lst two hours (mR) b. Total 10000m dose for 17,670 0.9 days (mR) 	6.	Whole Body Dose R	esults		
 b. Total 10000m dose for 567 0.06 30 days (mR) 7. Thyroid Dose Results a. Total 800m dose for 95,900 1.25 lst two hours (mR) b. Total 10000m dose for 17,670 0.9 30 days (mR) 		a. Total 800m do 1st two hours	se for 5,600 (mR)	0.365	
 7. Thyroid Dose Results a. Total 800m dose for 95,900 1.25 1st two hours (mR) b. Total 10000m dose for 17,670 0.9 30 days (mR) 		b. Total 10000m 30 days (mR)	dose for 567	0.06	
 a. Total 800m dose for 95,900 1.25 1st two hours (mR) b. Total 10000m dose for 17,670 0.9 30 days (mR) 	7.	Thyroid Dose Resu	lts		
b. Total 10000m dose for 17,670 0.9 30 days (mR)		a. Total 800m do 1st two hours	se for 95,900 (mR)	1.25	
		b. Total 10000m 30 days (mR)	dose for 17,670	0.9	1

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DIABLO CANY	NUMBER REVISION DATE	EP P-2 5 6/15/84						
TITLE RELEASE OF AIRBORNE RADIOACTIVE MATERIALS								
	SUMMARY SHEE MAJ	T 1A (Continu OR LOCA	ed)					
8.	Accident Classification (Based on above Dose):	General Emergency	Unusual Event					
	(Based on EP G-1):	Site Area Emergency	Site Area Emergency					
9.	Miscellaneous							
	a. Containment-free volume cc	7.36×10 ¹⁰						
	b. RCS Coolant Mass (gm)	2.4×10 ⁸		1.1.1.1.1.1.1.1				

DIABLO CANYON	EASE	OF AIRBORNE RADIOACTI	1 AND 2 VE MATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 50 OF 72
		SUMM MAJOR S	ARY SHEET 1B TEAM LINE BREAK	
		PARAMETER	FSAR DEA	FSAR EXPECTED ACTUAL
1.	Ini Ass	itial Conditions and sumptions		
	a.	Primary Coolant Activity (µCi/gm)		
		1) Xe-133 2) I-131 3) Other Iodine	270 2.6 7.9	67.2 0.65 2.0
	b.	Secondary Water Activity (uCi/gm)		
		1) I-131 2) Other Iodines	0.015 0.037	0.44×10 ⁻⁴ 0.90×10 ⁻⁴
	c.	Assumed Fuel Defects (%)	1	0.2
	d.	Primary to Secondary Leakage (gpm)	1	0.014
	e.	Steam Release, 1st Two Hours (1bs)		
		1) Failed Generator	97,000	
		 Other generator (atmospheric dump) 520,000	
	f.	Total Steam Release During 8-Hour Cooldow (lbs)	n 1,600,000	
	9.	Liquid Release Fracti for Iodine	on	
		 Failed Generator Other generators 	0.1 0.01	

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DIABLO CAN	YON POWER PLANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5
TITLE	RELEASE OF AIRBORNE RADIOACTIVE	DATE 6/15/84 PAGE 51 OF 72	
	SUMMARY SHEET MAJOR STEA	T 1B (Continued) AM LINE BREAK	
	PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
2.	Activity Release to Environs, First 2 Hours (CI	1)	
	a. Xe-133	56.8	0.172
	b. Other Noble Gases	5.2	0.016
	c. 1-131	0.157	0.00045
	d. Other Iodines	0.047	U.0013
	e. Effective Age of Mixture (hrs)	65	65
3.	(χ/Q) CL (sec/m ³)		
	a. 800m (site boundary)	5.29×10 ⁻⁴	5.29×10 ⁻⁵
	b. 10000m (6 mi. LPZ)	2.20×10 ⁻⁵	2.20×10 ⁻⁶
4.	Whole Body Dose Results		
	a. Total 800m dose for 1st two hours (mR)	1.8	0.0006
	<pre>b. Total 10000m dose for 30 days (mR)</pre>	0.32	0.0010
5.	Thyroid Dose Results		
	a. Total 800m dose for 1st two hours (mR)	65	0.012
	<pre>b. Total 10000m dose for 30 days (mR)</pre>	66	0.012
6.	Accident Classification (Based on above Dose):	Alert	No Emergency
	(Based on EP G-1):	Unusual Event	Unusual Event

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DIABLO CANYO	N POWER PLANT UNIT NO(S)	1 AND 2 MATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 52 OF 72
	SUMMARY SHEE MAJOR STE	T 1B (Continued) AM LINE BREAK	
	PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
7.	Miscellaneous		
	a. Fluid Mass/Stm Gen (1b	s)	
	1) Water 2) Steam	95,100 6,620	
	 b. Safety Valve and Steam Dump Valve Capacities (1b/hr/valve) 		
	 S.G. safety valve 10% atmospheric du 35% atmospheric du 	800,000 mp 380,000 mp 597,000	

DIABLO CANYON POWER PLANT UNIT NO(S)

1 AND 2

TITLE RELEASE OF AIRBORNE RADIOACTIVE MATERIALS

SUMMARY SHEET 1C MAJOR FEEDWATER LINE BREAK

The release from this accident comes from release of steam by safety valves and/or atomospheric steam dump of steam generator water during cooldown if the condenser is not available. The steam generator water is contaminated if there is tube leakage. The feedwater itself which is released has very little activity in it and is ignored. This accident is basically the same as a steam-line break and summary sheet 1B can be used. Note, however, that the steam release will be through relief valves and so the iodine liquid release fraction should be 0.01 for the entire release. This will reduce the thyroid dose somewhat from the steam-line break case.

BLACKOUT (PLANT COOLDOWN WITH ATMOSPHERIC DUMP)

The release from this accident comes from release of steam by safety valves and/or atmospheric steam dump of steam generator water is contaminated if there is tube leakage. This accident is basically the same as a steam-line break and summary sheet 1B can be used. Note, however, that the steam release will be through relief valves and so the iodine liquid release fraction should be 0.01 for the entire release. This will reduce the thyroid dose somewhat from the steam-line break case.

DIABLO	DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 NUMBER EP R-2 REVISION 5								
TITLE	REL	EASE	OF AIRBORNE RACIOACT	IVE MATERIALS	p;	AGE 54 OF 72			
			SMALL LOCA (RELEAS	MARY SHEET 1E E OF COOLANT TO (CONTAINMENT)				
			PARAMETER	FSAR DBA	FSAR EXPECTED	ACTUAL			
	1.	In (u	itial Coolant Activit Ci/gm)	у					
		a.	Xe-133	270	45.7				
		b.	Other Noble Gases	30	5.6				
		с.	1-131	2.62	0.45				
		d.	Other Iodine	7.88	1.35				
		e.	Effective Age of Mixture (hr)	60	60				
		f.	Fuel Defects ($\frac{\circ}{e}$)	1	0.2				
	2.	lni Con	itial Release to tainment (Ci)						
		a.	Xe-133	65,430	16,280				
		b.	Other Noble Gases	7,950	1,980				
		c.	1-131	63	16				
		d.	Other Iodine	193	48				
		e.	Assumption	100% of Coolant N.G. activity +10% of coolant iodines	100% of Coole N.G. Activity +10% of coole iodines	ant / ant			
	3.	Con Eff	tainment Spray ectiveness						
		a.	Removal Half-life (hrs)	0.022	0.0075				

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DIABLO CANYO	DN POWER PLANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5 DATE 6/15/84
TITLE	EASE OF AIRBORNE RADIOACTIVE	MATERIALS	PAGE 55 OF 72
	SUMMARY SHEET SMALL LOCA (RELEASE OF	1E (Continued) COOLANT TO CON	TAINMENT)
	PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
	 Number of operable spray pumps 	1	2
	c. Containment Leak Rate (%/day)	0.1 for 1st day, 0.05 after 1st day	0.05 for 1st day, 0.025 after 1st day
4.	Containment Leak Rate (%/day)	0.1	0.05
5.	(χ/Q) CL (sec/m ³)		
	a. 800m (site boundary)	5.29×10 ⁻⁴	5.29×10 ⁻⁵
	b. 10000m (6 mi. LPZ)	2.20×10 ⁻⁵	2.20×10 ⁻⁶
6.	Whole Body Dose Results		
	a. Total 800m dose for 1st two hours (mR)	0.18	0.004
	b. Total 10000m dose for 30 days (mR)	0.05	0.001
7.	Thyroid Dose Results		
	a. Total 800m dose for 1st two hours (mR)	0.2	0.0009
	b. Total 10000m dose for 30 days (mR)	0.03	0.0001
8.	Accident Classification (Based on above Dose):	Unusual Event	No Emergency
	(Based on EP G-1):	Site Area Emergency	Site Area Emergency

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DIABLO C	RELE	ASE	OF AIRBORNE RADIOACTIVE	1 AND 2 MATERIALS		UMBER REVISION DATE PAGE	EP R-2 5 6/15/84 56 OF 72
			SUMMARY SHEET	1E (Continued) COOLANT TO CON	TAINMENT)		
	9.	Mis	PARAMETER cellaneous	FSAR DBA	FSAR EXPECTED	ACTUA	L
		a.	Containment-Free Volume (cc)	7.36×10 ¹⁰			
		b.	RCS Coolant Mass (gm)	2.4×10 ⁸			
		c.	Liquid Release Fraction for Iodine	0.1			

DIABLO C	RELI	POW	ER PLANT UNIT NO(S) GF AIRBORNE RADIOACTIVE	1 AND 2 MATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 57 OF 72
			SUMMARY TUBE	SHEET 1F RUPTURE	
			PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
	1.	Ini Ass	itial Conditions and sumptions		
		a.	Primary Coolant Activity (uCi/gm)		
			1) Xe-133 2) I-131 3) Other Iodine	270 2.6 7.9	67.2 0.65 2.0
		b.	Secondary Water Activity (uCi/gm)		
			1) I-131 2) Other Iodines	0.015 0.037	0.44×10 ⁻⁴ 0.90×10 ⁻⁴
		с.	Assumed Fuel Defects (¥) 1	0.2
		d.	Primary to Secondary Leakage (gpm)	1	0.014
		e.	Steam Release, 1st Two Hours (1bs)		
			 Failed generator Other generators (atmospheric dump) 	31,000 380,000	
		f.	Total Steam Release During 8 hour Cooldown (lbs)	1,600,000	
		g.	Liquid Release Fraction for lodine	1	
			 Failed generator Other generators 	0.01 0.01	

DIABLO	CANYON	POWER PLANT UNIT	NO(S)	1 AND 2		NU RE DA	MEER VISION TE	EP R-2 5 6/15/84
TITLE	REL	EASE OF AIRBORNE	RADIOACTIV	E MATERIALS		PA	GĒ	58 OF 72
		<u>s</u>	UMMARY SHEE TUBE	T 1F (Contin RUPTURE	ued)			
	2.	PARAMETER Total Release	to Environs	FSAR DBA	EX	FSAR PECTED	ACTUAL	
		First 2 hours	(Ci)					
		a. Xe-133		10,980	2,38	3		
		b. Other Nobl	e Gases	1,067	234	4		
		c. I-131		0.75	(0.14		
		d. Other Iodin	nes	3.1	(0.62		
		e. Effective / Mixture (h	Age of rs)	65	65	5		
	3.	(x/Q) CL (sec/r	т ³)					
		a. 800 m (site	e boundary)	5.29×10-4	5.29>	10-5		
		b. 10000m (6 m	mi. LPZ)	2.20×10 ⁻⁵	2.20>	10-6		
	4.	Whole Body Dose	e Results					
		a. Total 800m 1st two hou	dose for urs (mP)	360	7	.7		
		b. Total 10000 for 30 days	Om dose s (mR)	15	C	.3		
	5.	Thyroid Dose Re	sults					
		a. Total 800m 1st two hou	dose for urs (mR)	340	4	.3		
		b. Total 10000 30 days (mR	om dose for	15	0	.2		
	6.	Accident Classi (Based on above	fication Dose):	Site Area Emergency	Alert			1
		(Based on EP G-	1):	Site Area Emergency	Site Emerg	Area ency		
	DC0249	58V						1.1

DIABLO CANYON POWER PLANT UNIT NO(S) TITLE RELEASE OF AIRBORNE RADIOACTIVE MA	1 AND 2 TERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 59 OF 72
SUMMARY SHEET 1F TUBE RUP	(Continued) TURE	
PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
7. Miscellaneous		
a. Fluid Mass/Stem Gen. (1bs)		
1) Water 2) Steam	95,000 6,620	
b. Safety Valve and Steam Dump Valve Capacities (lbs/hr/valve)		
 S.G. safety valve 10% atmospheric dump 35% atmospheric dump 	800,000 380,000 597,000	

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CIABLO CANYON POWER	PLANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5
TITLE RELEASE O	F AIRBORNE RADIOACT	IVE MATERIALS	DATE 6/15/84 PAGE 60 OF 72
	LOCKE	ARY SHEET 1G D ROTOR ACCIDENT	
	PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
. 1. Total R 1st Two	elease to Environs, Hours (Ci)		
a. Xe-	133	97	0.73
b. Othe	er Noble Gases	19.6	0.21
c. I-1	31	0.24	0.003
d. Othe	er Iodines	0.36	0.003
e. Effe Mixt	ective Age of Sure	50	50
f. Assu	umptions		
1)	Coolant Activity	1% fuel defects +3% of gap activity	0.2% fuel defects +3% of gap activity
2)	Primary to Secondary Leakage (gpm)	1	0.014
3)	Secondary Steam Release, 1st Two Hours (1bs)	617,000 6	17,000
4)	Total Steam Release During 8 Hour Cooldown (lbs)	1,600,000 1,6	•
2. (x/Q) LL	(sec/m ³)		
a. 800m	(site boundary)	5.29×10 ⁻⁴	5.29×10 ⁻⁵
b. 1000	m (6 mi. LPZ)	2.20×10 ⁻⁵	2.20×10 ⁻⁶

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DIABLO CAI	NYON P	OWER PLANT UNIT NOIS) E OF AIRBORNE RADIOACTIVE M	1 AND 2 ATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 61 OF 72
		SUMMARY SHEET 1 LOCKED ROT	G (Continued DR ACCIDENT)
		PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
3.	Who1	e Body Dose Results		
	a.	Total 800m dose for 1st two hours (mR)	4.4	0.004
	b.	Total 10000m dose for 30 days (mR)	0.5	0.0004
4.	Thyr	oid Dose Results		
	à.	Total 800m dose for 1st two hours (mR)	82	0.06
	b.	Total 10000m dose for 30 days (mR)	27	0.02
5.	Acci (Bas	dent Classification ed on above Dose):	Alert	No Emergency
	(Bas	ed on EP G-1)	Alert	Alert
6.	Misc	ellaneous		
	a.	Fluid Mass/Stm Gen. (1bs) 1) Water 2) Steam	95	5,100 5,620
	b.	Safety Valve and Steam Dump Valve Capacity (lbs/hr/valve) 1) S.G. safety valve 2) 10% atmospheric dump 3) 35% atmospheric dump	800 380 597	0,000 0,000 7,000
	c.	Liquid Release Fraction for Iodines	0.01	

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DIABLO	CAN	ON P	POWER PLANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5 DATE 6 (1E/84
TITLE	;	RELE	ASE OF AIRBORNE RADIOACTIVE	PAGE 62 OF 72	
			FUEL HANDLING ACCIDE	RY SHEET IH INT IN FUEL HANDLIN	NG BLDG
			PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
	1.	Int	itial Conditions		그렇는 다 같은 것 같은 것
		a.	Radial Peaking Factor of Damaged Assembly	1.65	1.26
		b.	Elapsed Time Since Reactor Shutdown (hrs)	100	100
		c.	Type of Release to Pool	100% of assembly gap activity	100% of assembly gap activity
		d.	Bundle Submergence (ft)	26	26
		e.	Pool Decontamination Factor for Iodine	100	760
		f.	Total Assembly Gap Activity at Time of Accident 1) Xe-133 2) Other Noble Gases 3) I-131 4) Other Iodines 5) Effective Age of Mixture (hr)	100,000 4,500 52,670 7,000 600	8,137 1,500 5,282 220 600
	2.	(x/	Q) CL (sec/m ³)		
		a.	800m (site boundary)	5.29×10-4	5.29×10 ⁻⁵
		ь.	1000m (6 mi. LPZ)	2.20×10 ⁻⁵	2.20×10 ⁻⁶
	3.	Tot 1st	al Release to Environs, Two Hours (Ci)		
		â.	Xe-133	100,400	523
		b.	Other Noble Gases	4,100	101

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DIABLO CAN	RELE	POWER PLANT UNIT NO(S) ASE OF AIRBORNE RADIOACTI	1 AND 2 VE MATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 63 OF 72
		SUMMARY SH FUEL HANDLING ACCI	EET 1H (Continued) DENT IN FUEL HANDLI	NG BLDG
		PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
	с.	1-131	80	0.005
	d.	Other Iodines	10	0.0002
	e.	Effective Age of Mixture (hrs)	600	600
4.	Who	ole Body Dose Results		
	а.	Total 800m dose for 1st two hours (mR)	2,450	1.5
	b.	Total 10000m dose for 30 days (mR)	102	0.06
5.	Thy	vroid Dose Results		
	a.	Total 800m dose for 1st two hours (mR)	22,200	0.08
	b.	Total 10000m dose for 30 days (mR)	923	0.003
6.	Acc (Ba	ident Classification ised on above dose):	General Emergency	y Alert
	(Ba	sed on EP G-1):	Site Area Emergency	Site Area Emergency
7.	Mis	cellaneous		
	a.	Fuel Handling Building Volume (ft ³)	435,000	
	b.	Fuel Handling Building Exhaust Rate (cfm)	35,700	35,700
	с.	Filter Cleanup Factor	0.10	0.01
and the second second second				

DC0249 63V

63V

DIABLO CAN	RELE	POWER PLANT UNIT NO(S) ASE OF AIRBORNE RADIOACT	1 AND 2 IVE MATERIALS	NUMEER EP R-2 REVISION 5 DATE 6/15/84 PAGE 64 OF 73
		FUEL HANDLING	MARY SHEET 11 ACCIDENT IN CONTA	INMENT
		PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
1.	Int	itial Conditions		
	a.	Radial Peaking Factor of Damaged Assembly	1.65	1.26
	b.	Elapsed Time Since Reactor Shutdown (hrs)	100	100
	с.	Type of Release to Pool	100% of assembly gap activity	100% of assembly gap activity
	d.	Bundle Submergence (ft)	26	26
	e.	Pool Decontamination Factor for Iodine	100	760
	f.	Total Assembly Gap Activity at Time of Accident (Ci)		
		1) Xel33	100,000	8,137
		2) Other Noble Gases	4,500	1,500
		3) I-131	52,670	5,282
		4) Other Iodines	7,000	220
		5) Effective Age of Mixture (hrs)	600	600
2.	(x/	<pre>\$) CL (sec/m³)</pre>		
	a.	800m (site boundary)	5.29×10 ⁻⁴	5.29×10 ⁻⁵
	b.	1000m (6 mi. LPZ)	2.20×10 ⁻⁵	2.20×10 ⁻⁶

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DIABLO	CANYO	N POWER PLANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5					
TITLE	RE	LEASE OF AIRBORNE RADIOACT	IVE MATERIALS	DATE 6/15/84 PAGE 65 OF 72					
	SUMMARY SHEET 11 (Continued) FUEL HANDLING ACCIDENT IN CONTAINMENT								
		PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL					
	3.	Total Release to Environs, 1st Two Hours (Ci)							
		a. Xe-133	12,460	38					
	t	b. Other Noble Gases	557	7					
	(. I-131	65	0.033					
	(d. Other lodines	8.7	0.0013					
	e	Effective Age of Mixture (hrs)	600	600					
	4. k	hole Body Dose Results							
	a	. Total 800m dose for 1st two hours (mR)	310	0.1					
	b	. Total 10000m dose for 30 days (mR)	13	0.004					
	5. T	hyroid Dose Results							
	a	. Total 800 m dose for 1st two hours (mR)	18.4×10 ³	0.6					
	b	. Total 10000m dose for 30 days (mR)	0.76×10 ³	0.03					
	6. A	ccident Classification Based on above Dose):	General Emergency	Alert					
	()	Based on EP G-1):	Site Area Emergency	Alert					
	7. M R	iscellaneous Activity elease Mechanism	Activity released containment atmosp directly above the level. It is pick coolers and sent of containment purge.	from cavity to here is confined cavity water ed up by the fan ut through the					

DIABLO CAN	NYON I	POWER PLANT UNIT NO(S)	1 AND 2	NUMBER REVISION DATE PAGE	EP R-2 5 6/15/84 66 05 72
TITLE	RELE	ASE OF AIRBORNE RADIOA	CTIVE MATERIALS		
		, SU ROD	UMMARY SHEET 1J		
		PARAMETER	FSAR DBA	ESAR EXPECTED ACTUA	
1.	Tot	tal Release to Containm re Volume (Ci)	nent	<u>EATECTED</u> ACTOR	
	a.	Xe-133	2.01×10 ⁵	1.52×10 ⁵	
	ь.	Other Noble Gases	6.82×104	6.22×104	
	с.	I-131	7.32×10 ³	7.28×10 ³	
	d.	Other Iodine	. 1.11×104	1.09×104	
	e.	Effective Age of Mixture (brs)	40	40	
	f.	Release Assumption	Coolant activity (1% defects) plus 10% of core gap activity times a liquid release fraction of either 0.1 (for I) or 1.0 (for N.G.)	Coolant activity (0.2% defects) plus 10% of core gap activity times a liquid release fraction of either 0.1 (for I) or 1.0 (for N.G.)	
2.	Con Eff	tainment Sprag ectiveness			
	а.	Removal half-life (hrs)	0.022	0.0075	
	b.	Number of operable spray pumps	1	2	
3.	Con: (%/(tainment Leak Rate day)	0.1	0.05	1999. 1999 199
4.	(x/(CL (sec/m³) 			
	a.	800m (site boundary)	5.29×10 ⁻⁴	5.29×10 ⁻⁵	
	b.	1000m (6 mi. LPZ)	2.20×10 ⁻⁵	2.20×10 ⁻⁶	1

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DIABLO	CAN	RELE	POWER PLANT UNIT NO(S) ASE OF AIRBORNE RADIOACTI	1 AND 2 VE MATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 67 OF 72
			SUMMARY SH ROD EJ	EET 1J (Continued) ECTION ACCIDENT	
	5.	To 1s	PARAMETER tal Release to Environs, t 2 Hours (Ci)	FSAR DBA	FSAR EXPECTED ACTUAL
		а.	Xe-133	11.2	5.6
		b.	Other Noble Gases	4.1	2.0
		с.	1-131	0.0098	0.002
		d.	Other Iodine	0.015	0.002
		e.	Effective Age of Mixture (hrs)	40	40
		f.	Release Mechanism	Containment (Leakage L	Containment .eakage
	6.	Who	ole Body Dose Results		
		а.	Total 800m dose for 1st two hours (mR)	0.73	0.04
		b.	Total 1000m dose for 30 days (mR)	0.13	0.006
	7.	Thy	roid Dose Results		
		a.	Total 800m dose for 1st two hours (mR)	3.3	0.04
		b.	Total 10000m dose for 30 days (mR)	0.14	0.002
	8.	Acc (Ba	ident Classification sed on above Dose):	Unusual Event	No Emergency
		(Ba	sed on EP G-1):	Site Area Emergency	Site Area Emergency
	9.	MIS	certaneous		
		a.	Containment free volume (cc)	7.36×10 ¹⁰	
		b.	RCS Coolant Mass (gm)	2.4×10 ⁸	
	DCO	249	67V		

DIABLO CA	NYO	N P	OWER PLANT UNIT NO(S)	NUMBER EP R-2 REVISION 5	
TITLE	RE	LEA	SE OF AIRBORNE RADIOACTIV	PAGE 68 OF 72	
			GAS DECA	RY SHEET 1K Y TANK RUPTURE	
			PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
1	•	Tot 1st	al Release to Environs, Two Hours (Ci)		
		a.	Xe-133	65,400	16,300
		b.	Other Noble Gases	7,300	2,140
2		(x/	() CL (sec/m ³)		
		a.	800m (site boundary)	5.29×10 ⁻⁴	5.29×10 ^{'5}
		ь.	10000m (6 mi. LPZ)	2.20×10 ⁻⁵	2.20×10 ⁻⁶
3		Who	le Body Dose Results		
		a.	Total 800m dose for 1st two hours (mR)	2,010	44
		b.	Total 10000m dose for 30 days (mR)	84	2
		NOT	E: Thyroid doses are neg	ligible	1
4	•	Acc (Ba	ident Classification sed on above Dose):	General Emergency	Site Area Emergency
		(Ba	sed on EP G-1):	Alert	Alert
5		Mis	cellaneous		
		a.	Tank Volume (cc)	2.18×10 ⁻⁷	
		b.	Tank Press	100 psi	
		c.	Volume Released (cc)	1.48×10 ⁸ cc	

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c.s

ABLO CANYO	ON F	POWER PLANT UNIT NO(S) ASE OF AIRBORNE RADIOACTIVE	1 AND 2 MATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 69 OF 72
		SUMMAR) LIQUID HOLDI	SHEET IL UP TANK RUPTURE	
		PARAMETER	FSAR DBA	ESAR EXPECTED ACTUAL
1.	Act	tivity in Holdup Tank (Ci)		
	a.	Xe-133	51,000	10,200
	ь.	Other Noble Gases	4,710	930
	с.	I-131	492	98.3
	d.	Other Iodines	1,086	217
	e.	Effective Age of Mixture (hrs)	60	60
2.	Cle	anup Parameters		
	a.	Liquid Release Fraction for lodines from Tank to Auxiliary Building Atmosphere	10-4	10-4
	b.	Charcoal Filter Cleanup Factor	0.1	0.01
	c.	Release Duration (hrs)	2	2
3.	Act Env (Ci	ivity Release to irons, 1st Two Hours)		
	a.	Xe-133	51,000	10,200
	b.	Other Noble Gases	4,710	930
	c.	I-131	0.00492	0.0098
	d.	Other Iodines	0.01086	0.00217
DIABLO	CAN	YON POWER PLANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5 DATE 6/15/84
--------	-----	--	---	---
TITLE		RELEASE OF AIRBORNE RADIOACT	IVE MATERIALS	PAGE 70 UF 72
		SUMMARY SH LIQUID HO	HEET 1L (Continued) DEDUP TANK RUPTURE	
		PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
	4.	(χ/\dot{Q}) CL (sec/m ³)		
		a. 800m (site boundary)	5.29×10 ⁻⁴	5.29×10 ⁻⁵
		b. 10000m (6 mi. LPZ)	2.20×10 ⁻⁵	2.20×10 ⁻⁶
	5.	Whole Body Dose Results		
		a. Total 800m dose for 1st two hours (mR)	1,440	37
		<pre>b. Total 10000m dose for 30 days (mR)</pre>	60	1.6
	6.	Thyroid Dose Results		
		a. Total 800m dose for 1st two hours (mR)	1.93	.0.003
		b. Total 10000m dose for 30 days (mR)	0.08	0.0001
	7.	Accident Classification (Based on Dose):	Site Area Emergency	Site Area Emergency
		(Based on EP G-1):	Alert	Alert
	8.	Miscellaneous		
		a. Tank Volume (cc)		3.03×10 ⁸

RELEASE OF AIRBORNE RADIOACTIVE	1 AND 2 MATERIALS	NUMBER EP R-2 REVISION 5 DATE 6/15/84 PAGE 71 OF 72
SUMMARY VOLUME CONTE	A SHEET 1M ROL TANK RUPTURE	
PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
1. Activity in VCT (Ci)		
a. Xe-133	3,330	828
b. Other Noble Gases	198	42
c. 1-131	12.1	3.0
d. Other Iodines	35	8.7
e. Effective Age of Mixture (hrs)	60	60
2. Cleanup Parameters		
a. Liquid Release Fraction for Iodines from Tank to Auxiliary Building Atmosphere	10-4	10-4
b. Charcoal Filter Cleanup Factor	0.1	0.01
c. Release Duration (hrs)	2	2
 Activity Release to Environs, 1st Two Hours (Ci) 		
a. Xe-133	3,330	828
b. Other Noble Gases	198	42
c. I-131	0.00012	0.000003
d. Other Iodines	0.00035	0.00009

DIABLO CA	NYON POWER PLANT UNIT NO(S)	1 AND 2	NUMBER EP R-2 REVISION 5 DATE 6/15/84
TITLE	RELEASE OF AIRBORNE RADIOACTIV	E MATERIALS	PAGE 72 OF 72
	SUMMARY SHE VOLUME CON	ET 1M (Continued) TROL TANK RUPTURE	
	PARAMETER	FSAR DBA	FSAR EXPECTED ACTUAL
4.	(χ/\dot{Q}) CL (sec/m ³)		
	a. 800m (site boundary)	5.29×10 ⁻⁴	5.29×10 ⁻⁵
	b. 1000m (6 mi. LPZ)	2.20×10 ⁻⁵	2.20×10 ⁻⁵
5.	Whole Body Dose Results		
	a. Total 800m dose for 1st two hours (mR)	465	9.3
	<pre>b. Total 10000m dose for 30 days (mR)</pre>	. 19	0.4
6.	Thyroid Dose Results		
	a. Total 800m dose for 1st two hours (mR)	0.03	0.00004
	 Total 10000m dose for 30 days (mR) 	0.001	0.000002
7.	Accident Classification (Based on Dose):	Site Area Emergency	Alert
	(Based on EP G-1):	Alert	Alert
8.	Miscellaneous		
	a. Tank Volume (cc)	1.1×10′	

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Page 1 of 2

		PACIFIC GA NUCLEA DIABLO CANYON P	S AND ELECTRIC COM R PLANT OPERATIONS OWER PLANT UNIT NO	PANY 5. 1 AND 2
		INITIAL EMER	GENCY NOTIFICATION	FORM
	Date/ /	Time (Form C	AM/PM ((Number Sequentially)
Per	son Authorizing Report			(DCPP Only)
		Site Emergi	ency Coordinator	
Dat	a Sheet Completed By			(DCPP Only)
Ide at	ntify yourself, state the Diablo Canyon Power Plant	call is to provide the	vide initial notif	cation of an emergency condition nation:
1.	Describe what happened:			
				and the providence of the
2.	Unit Involved [A] 1	[8] 2		
5.	Time incident started	AM/1	PM	
4.	Situation Involves			
	[A] No Release	[C] Imminent	Release	[E] Release has occured, but is stopped
	[B] Potential Release	[D] Release	is Occuring	
5.	Offsite Assistance <u>Fire</u> (Cal. De <u>Medical</u> (SLO Amb Law Enforcement (SLO Cou	pt. of Forestry pulance/French H) [A] Has ospital) [B] Has [C] Is	been requested been requested has been requested
6	Empropry Classification	- Provide stan	tard message or mor	lify as required by the
0.	situation. Note any mod	ification made.	ard message or mot	iny as required by the
			10	Message
	LIASSIFICATION		(101)	SLO County/Calif. DES/
	[A] Unusual Event		Notifica organiza required no furth	ition of key emergency ition personnel is i at this level, but ier response is necessary.
	[B] Alert		Notifica response activati response PGandE i	tion of all emergency organizations and on of the EOC and other centers is required. s activating the EOF.
	DC0042 6V			

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PACIFIC GAS AND ELECTRIC COMPANY NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

Classificaton

- [C] Site Area Emergency (Consider protective actions [B] or [C])
- [D] General Emergency (Recommend protective action [D] or [E])

Message (for SLO County/Calif. OES)

Immediate mobilization of emergency response personnel is required. PGandE is activating the EOF.

Immediate mobilization of emergency response personnel is required. PGandE is activating the EOF.

Affected sector (check one) - Wind Speed ____mps (x2.2) = ____mph

WIND FROM WIND TOWARD AFFECTED DEGREES DIRECTION AFFECTED SECTOR PAZ'S (Basic EPZ) 81------SSW------C]------SW------------ 57-78-----ENE------WSW------D ------I02-123-----ESE-----WNW-----1.2 G1-----NW-----1,2 H1-----NNW-----1,2,5,9 1-----169-191-----S-----N-----1,2,5,9 J]-----NNE-----1,2,5,9 KI-----NE-----1,2,4,8 L]-----ENE----1,2,3,4,8 M1-----E-----1,2,3,4,7,8,11 N]-----ESE----1,2,3,6,7,10,11,12 0]-----SE-----1,2,12 P]-----SSE-----

 Recommended General Public Protective Actions (Refer to Table 1 and Figure 1 of EP G-3)

[A] None

- [B] Evacuation of the site, and PAZ 1.
- [C] Evacuate transients (Montana de Oro visitors, agriculture workers, etc.) in the low population zone (PAZ's 1 and 2) starting with the affected sector and two adjacent sectors.
- [D] Evacuate the low population zone (PAZ's 1 and 2)) starting with the affected sector and two adjacent sectors. Alert the public in the basic emergency planning zone using the Early Warning System Sirens and EBS Broadcasts.
- [E] Take actions specified in [D] and shelter personnel in the affected sector and two adjacent sectors in the basic EPZ.

RETAIN THI. FORM FOR EVENT EVALUATION

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69-10262 7/82 (100) PACIFIC GAS AND DEPARTMENT OF NUCL DIABLO CANYON POWER F	Sheet 1 of 4 EAR PLANT OPERATIONS PLANT UNIT NOS. 1 AND 2
PART A: RADIOLOGICA	AL EMERGENCY STATUS FORM
Provide as much information as is available the status report.	and appropriate at the time of
Date:// Time:AM/PN (Form Completed)	<pre>M Status Report # (Number Sequentially)</pre>
Person Authorizing Report: Site Emergency ((DCPP only)
Person Transmitting Report:	Location (DCPP only)
TSC DIST: (9 copies)	EOF DIST: (10 copies)
 Site Emergency Coordinator Emergency Evaluation & Recovery Coord. Emergency Liason Coordinator (2) Emergency Maintenance Coord. Emergency Operations Coordinator Emergency Radiological Advisor NRC Office TSC File TSC Status Board 	 Recovery Manager UDAC Advisor To The County Radiological Emerg., R.M. Operations and Analytical, R.M. Engineering and Logistics, R.M. Public Information, R.M. Coporate Law Dept. Coord. EOF Status File EOF Emerg. Status Board
1. Emergency Classification:Unusual H	EventAlert ea EmergencyGeneral Emergency
2. Update on Incident: Date/_/	Time Incident Began:AMPM
 a. Site Emergency Signal Sounded b. What Happened: 	YES [] NO []
3. Radiological Release Information: (at	tach isotopic breakdown if available)
a. Time Data Collected:	AM/PM Unit Involved12
b. Release:OccurringAntici	patedWhen:AM/PM ·
c. Location of Release:Plant Ve	ntSteamSurfaceLiquid Dch
d. Estimated Duration of Release: _	Hours

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	DEPARTMENT OF NUCLEAR PLANT DIABLO CANYON POWER PLANT UNIT	OPERATIONS NOS. 1 AND 2		
e.	Release Monitored: by monitors #			<u></u>
f.	Iodine: Est. Total QuantityCi	Release Rate	c	i/sec,
g.	Particulates: Est. Total Quantity	_Ci Release Rate	e	_Ci/sec.
h.	Noble Gases: Est. Total Quantity	_Ci Release Rate	e	_Ci/sec,
i.	Estimate of Surface Contamination:dpm (attach form 69-10296 for out of plant cont	/100cm ² Where: amination readin	ngs)	<u> </u>
j.	Unusual Radiation Levels in Plant: Where:		mR/hr:	
k.	Radiation Level at site boundary (downwind)	(sector)	mR/hr:	
1.	Meteorological Date (Use 10m elevation on p Source	rimary met tower	r or 's gr	hate other)
1. m.	Meteorological Date (Use 10m elevation on p Source	rimary met tower h Direction (fr	ror s gr	de:
1. m. n.	Meteorological Date (Use 10m elevation on p Source	rimary met tower h Direction (fr FogCloudy	ror sgr	de:
1. m. n.	Meteorological Date (Use 10m elevation on p Source	rimary met tower h Direction (fr FogCloudy	r or 's gr rom):degr	nate other deg rees C/m
1. m. n.	Meteorological Date (Use 10m elevation on p Source	rimary met tower h Direction (fr FogCloudy (10m to 76m or Mixing Dept	r or 's gr rom): th)	nate other deg rees C/m m.
1. m. n. o.	Meteorological Date (Use 10m elevation on product Source	rimary met tower h Direction (fr FogCloudy (10m to 76m or Mixing Dept E RATE INTEGRAT R /hrM.B.	r or 's gr rom): degr th) th TED DOSE	nate other deg
1. m. n. o.	Meteorological Date (Use 10m elevation on post Source	rimary met tower h Direction (fr FogCloudy (10m to 76m or Mixing Dept E RATE INTEGRAT R /hrW.B.	r or 's gr rom): degr th) th TED DOSE THY	nate other deg deg
1. m. n. o.	Meteorological Date (Use 10m elevation on product Source	rimary met tower h Direction (fr FogCloudy (10m to 76m or Mixing Dept E RATE INTEGRAT R /hrM.B.	r or 's gr rom): degr th) th TED DOSE	nate other deg deg deg deg deg deg deg deg deg
1. m. n. o.	Meteorological Date (Use 10m elevation on post Source	rimary met tower h Direction (fr FogCloudy (10m to 76m or Mixing Dept E RATE INTEGRAT R /hrM.B.	r or 's gr rom): degr th) th TED DOSE THY	nate other deg dgd
1. m. n. o.	Meteorological Date (Use 10m elevation on products) Wind Velocity: m/secx2.2= mpl Weather Conditions: Rain Clear Stability: Delta T: X/Q 800m= E Projection Time E DOSE PROJECTIONS PLUME ARRIVAL DOSE PROJECTIONS PLUME ARRIVAL Site Boundary (800m)	rimary met tower h Direction (fr FogCloudy (10m to 76m or Mixing Dept E RATE INTEGRAT R /hr mF . THY W.B.	r or 's gr rom): degr th) TED DOSE	nate other deg rees C/m m. M.

5. Emergency Response Actions Underway by PGandE:

6. Prognosis for Escalation or Termination of Accident:

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4.

60 10	1262	7/02 /	1001
03-10	1605	1104 1	1001

Sheet 3 of 4

PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

PART B: MISCELLANEOUS EMERGENCY INFORMATION FORM

Provide as much information as is available and appropriate at the time of the status report.

Date	•	/_/ Time:AM/PM Status #(Number sequentially,
Pers	on Au	thorizing Report:(DCPP only)
Perso	on Pr	eparing Report: Location(DCPP only)
Time	Data	CollectedAM/PM
1.	Pers	onnel Injuries: How Many?
	а.	Type: Contamination:YesNo
	b.	Injured Person Location:PlantAmbulanceHospital(wnich)(wnich)(wnere)
	с.	Ambulance requestedNo, Location
2.	Fire	s:
	a.	Location: Time Reported:AM/PM
	b.	Type: Electrical Fuel(what kind)
	с.	Contamination Present:YesNo
	d.	Fire Assistance Requested:YesNo
	e.	Fire Assistance Onsite:YesNo
3.	Secu	rity/Safeguards:
	a.	Bomb Threat: Search Conducted:YesNo
		Search Results:
		Site Evacuated:No
	ь.	Intrusion: Insider: Outsider
		Point of Intrusion: Extent of Intrusion:
		Apparent Purpose:
		그녀는 것은 것을 하는 것을 다 가지 않는 것을 하는 것을 수 있는 것을 하는 것을 하는 것을 하는 것을 하는 것을 수 있는 것을 수 있는 것을 수 있는 것을 수 있는 것을 하는 것을 수 있는 것을 수 있는 것을 수 있는 것을 하는 것을 수 있는 것을 수 있다. 것을 수 있는 것을 것을 수 있는 것을 것을 수 있다. 것을 것 같이 것 같이 것 같이 없는 것을 것 같이 것 같이 없다. 것 같이 것 같이 없는 것 같이 없는 것 같이 없다. 것 같이 것 같이 것 같이 없다. 것 같이 것 같이 않는 것 같이 없는 것 같이 없다. 것 같이 것 같이 없는 것 같이 없는 것 같이 없다. 것 같이 없 것 같이 없는 것 같이 없다. 것 같이 없는 것 같이 없다. 것 같이 않는 것 같이 없다. 것 같이 것 같이 없다. 것 같이 않는 것 같이 없다. 것 같이 것 같이 않는 것 같이 않는 것 같이 않는 것 같이 없다. 것 같이 없다. 것 같이 않는 것 같이 없다. 것 같이 않는 것 않는 것 같이 않는 것 않는 것 같이 않는 것 않 것 같이 것 않는 것 같이 않는 것 같이 않는 것 않는 것 않는 것 않는 것 않는 것 않는 것 같이 않는 것 않는

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	69-	10262 7/82 (100) PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2
Part	B:	Miscellaneous Emergency Information Form
	c.	Strikemonstrations: Size of Group:
		Purpose:
	d.	Sabotage: Radiological:YesNo Arson:YesNo
		Equipment/Property:
	e.	Extortion: Source (phone, letter, etc.):
		Location of Letter:
		Demands:
	f.	General: Firearms Involved:YesNo Violence:YesNo
		Control of Facility Compromised or Threatened:YesNo
		Stolen/Missing Material:
		Agencies Notified (FBI, State Police, County Sheriff, etc.):
		(firele accortics onsite)
		(circle agencies onsice)
4.	Pre	ss information:
	Loc	ation of Press Release:San Francisco/San Luis Obispo
	Oth	er:(wriere)
	Tim	e of Press Release:AM/PM
	New	s Media Interest:YesNo Local/National:
Data	Rec	eived Rv:
Dates	-	/_/Time:AM/PM
		RETAIN THIS FORM FOR EVENT EVALUATION





REV

CURRENT

EMERGENCY PLAN

IMPLEMENTING PROCEDURES

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	coase Initial Actions During An Emergency	0
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KB-158	SPASS Reactor coordine sampring to the	

RB-15C	SPASS Containment Air Sampling	0
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	(Not Intended to Meet The 3-Hour Time Limit)	0
RB-16B1	SPASS Diluted Liquid Sampling From Reactor Coolant	
	(Not Intended to Meet The 3-Hour Time Limit)	0
RB-16B2	SPASS Undiluted Liquid Sampling From Reactor Coolant	
	(Not Intended to Meet The 3-Hour Time Limit)	0
RB-16B3	SPASS Reactor Coolant Stripped Gas Sampling	
	(Not Intended to Meet The 3-Hour Time Limit)	0
RB-16B4	SPASS Diluted Liquid Sampling From Radwaste	
	(Not Intended to Meet The 3-Hour Time Limit)	0
RB-1685	SPASS Undiluted Liquid Sampling From Radwaste	
	(Not Intended to Meet The 3-Hour Time Limit)	0
RB-16C	SPASS Containment Air Sampling	1.1.1.1.1.1.1.1
	(Not Intended to Meet the 3-Hour Time Limit)	0
RB-16D	SPASS Gas Chromatographic Hydrogen Analysis	11.00
	(Not Intended to Meet the 3-Hour Time Limit)	0
RB-16E	SPASS Liquid and Gas Sample Handling	
1.1.1	(Not Intended to Meet The 3-Hour Time Limit)	0
RB-16F	SPASS Data Analysis	
1997 - 1 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	(Not Intended to Meet The 3-Hour Time Limit)	0
RB-16G	SPASS Ion Chromatographic Chloride Analysis	
	(Not Intended to Meet The 3-Hour Time Limit)	0
RB-16H	SPASS Ph/Conductivity Dissolved Oxygen	
	(Not Intended to Meet The 3-Hour Time Limit)	0
RB-16I	SPASS Undiluted Containment Air Sampling	
	(Not Intended to Meet The 3-Hour Time Limit)	0
RB-16J	SPASS Sample Storage and Disposal	
	(Not Intended to Meet The 3-Hour Time Limit)	0

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,	APPROVED: R. C. Thombury PLANT MANAGER	8-1-84 DATE	-	S	TO
SCOPE					
This pro any HP-9 Emergenc the Cont Operatio	cedure provides startup instructions and operat 845C station capable of functioning as a contro y Assessment and Response System (EARS). These rol Room (CR), Technical Support Center (TSC), ns Facility (EOF).	ting flow olling sta EARS sta and Emerg	diag tion tion ency	rams for s in	for the clude
In addit of the s is inclu	ion a discussion of the terminology used, and a upport software and data file contents and struded.	brief ov acture use	ervi d in	ew o the	f some EARS
Startup containe	and operating instructions for the EARS TSC HP- d in procedure EP EF-8.	1000F com	pute	r ar	e
This pro	cedure and changes thereto requires PSRC review				
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7.	EARS Support Software for HP-9845C)
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DISCUSSION

The purpose of the EARS is to assist the Company Emergency Response Organization and offsite authorities in quantifying offsite radiological consequences should radioactive isotopes be released during an accident at the DCPP. The system gathers data on meteorological parameters, onsite and offsite real time radiation monitor readings. It performs dispersion computations, disseminates information and displays data to various onsite and offsite stations. These stations include the CR, the TSC, the EOF, the Corporate Incident Response Center (CIRC), and the State Office of Emergency Services (OES) stations.

The CR, TSC, and EOF are all capable of being the controlling station; although only one can be the controller at any one time. Any station that is not functioning as the controller can receive calculational results from the EARAUT (EARS automatic) program via communication links. If the links are disrupted, EARS can function by means of the manual EARS program (EARMAN), using data obtained via voice communication with the controlling station operator.

This procedure provides the necessary information for CR, TSC, and EOF operators to start up the EARS computer hardware and run the three primary EARS programs (STATUS, EARAUT, EARMAN) on the HP-9845C desktop computer at the respective station.

The structures and contents of all EARS data files at the CR. TSC, and EOF EARS stations is given in Ref. 1.

PROCEDURE

1. EARS Hardware at Controlling Stations

All HP hardware at the CR, TSC and EOF is covered by a service maintenance agreement with Hewlett-Packard, Inc. (see Appendix A for a complete list of hardware). In case of any hardware failure, contact the System Manager of the EARS and explain the problem to him. If the System Manager or his alternate cannot be contacted, the EARS operator may call Hewlett-Packard service [800]821-2446 directly during business hours (8 a.m. to 5 p.m., Monday thru Friday).

DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 NUMBER EP EF-6 REVISION 3 DATE 07/06/84 PAGE 3 OF 63 TITLE OPERATING PROCEDURES FOR EARS 9845C CONTROLLING STATIONS 2. Start-Up Procedures The following start-up procedures assume that all power to the computer hardware is off when the EARS operator arrives at an EARS station. Set the power strip switch on. All of the equipment at each station a. is connected to one power strip which is located on the back of the desk console, except at the TSC-CC where it is attached to the console underneath the HP-9845C. This should turn everything on if . the station was left in proper order, with all of the individual component switches set to the "ON" or "1" position. Check to see that all of the switches on all of the components are set to "ON" or "1" at this point. Check to see that the 7906 disc drive RUN/STOP switch is set to 5. "RUN". After about one minute the front panel of the 7906 should display 'DRIVE READY'. Check to see that the HP-9845C computer power switch (on the right с. side of the computer) is set to "1". The CRT should beep and begin a self-test ("MEMORY TEST IN PROGRESS" message should appear on the CRT). When the self-test is completed, the "9845 READY FOR USE" message and a flashing cursor will appear on the CRT indicating the computer is ready for use. d. After the entire system at this station is turned on, check the paper reserve in the HP-9845C internal printer. Instructions on how to load a new roll of thermal paper into the HP-9845C internal printer is given in Appendix B. 3. Shut-Down Procedures Place the 7906 disc drive RUN/STOP switch to the STOP position, and a. wait for the 'DOOR UNLOCKED' light to appear on the front panel of the disc. Turn the power strip switch to off position. This should turn off b. all of the equipment. 4. Power Failure Should the power to the system be lost during operation, the system must be shut-down as described in section 3 before power is restored. Any data in the computer memory is erased by power failure.

DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 NUMBER EP EF-6 REVISION DATE 07/06/84 4 OF 63 PAGE TITLE OPERATING PROCEDURES FOR EARS 9845C CONTROLLING STATIONS 5. EARS Software and Flow Diagrams There are three primary EARS programs stored on the HP-7906 disc drive (select code: C12): 1) "STATUS: for non-emergency (or idle) mode operations; 2) "EARAUT" automatic EARS program; and 3) "EARMAN" manual EARS program for emergency mode operations. There are two basic modes in which the EARAUT program can be operated: CONTROL and NON-CONTROL Only the CR and the TSC EARS stations at DCPP, and the EOF EARS station at the Sheriff's Office in San Luis Obispo can be operated in the CONTROL mode. Only one station can serve as the controller at any one time. Data is transmitted to all NON-CONTROL stations in fixed data strings containing information about the accident. instrument readings, calculated dose results, and messages. Once the EARS station is activated, the operator should start running the STATUS program. If the emergency mode of EARS has already been established at another controlling station, EARAUT program will automatically be loaded from the disc and be run on the HP-9845C. The flow diagrams following each program description are intended to give an EARS operator a general overview of the operator logic flow for each of the main EARS programs. The numbers in the flow diagrams reference other "KEY SETS" within the same program, whereas the letters reference specific entry points within the same or other programs. a. STATUS When EARS is not operated in the emergency mode, this program allows all HP-9845C stations to log onto the system for data polling purposes. As long as this station stays 'logged on' to the system, it can be 'scheduled' automatically to go into emergency mode by a CONTROL station when an emergency is declared. When 'logged on', this program allows the operator to poll the HP-1000 at the TSC for meteorology (MET), plant radiation monitors (RMS), or pressurized ion chambers (PIC) data. It also allows the operator to determine the system network status, such as which stations are currently logged on the system, and when they are logged on or off. In addition, the site and area maps can be displayed and 'dumped' to the thermal printer on the HP-9845C. Once logged on, the operator of one of the CONTROL stations can initiate the emergency mode of EARS by pressing the key under the CRT labeled 'START EARAUT'. This will load EARAUT and thereby begin the actual assessment of the emergency.

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- After the computer system at this station is up and running STATUS can be loaded and run by entering the following commands from the HP-9845C keyboard.
 - a) Type in 'SCRATCH'A', press [EXECUTE].
 - b) Type in 'SCRATCH C', press [EXECUTE].
 - c) Type 'LOAD "STATUS: C", 10' and press [EXECUTE] key.
- 2) The following three pages are flow diagrams for STATUS.





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TITLE	OPERATING PROCEDURES FOR EARS 9845C CONTROLLING STATIONS								
	b.	EARAUT PROGRAM (Controller)							
		The EARS automatic (EARAUT) controller program consists of two subprograms: EARADC (Central processing program for Controlling stations), and EARrdc (Release rate calculation subprogram), in addition to the EARAUT main entry program. These subprograms are loaded in and out of the HP-9845C as needed.							
		EARAUT can be loaded and run as the CONTROLLING station either by pressing the 'START EARAUT' softkey in the STATUS program, or by manually loading the program from disc and running it. Should you load EARAUT with the intentions of becoming the CONTROLLER, but someone else has already assumed that function from another station, you will automatically be logged on as NON-CONTROLLER when running the program.							
		 After the computer system at this station has been started up EARAUT can be loaded and run by entering the following commands from the HP-9845C keyboard. 							
		a. Type in 'SCRATCH A', press [EXECUTE].							
		b. Type in 'SCRATCH C', press [EXECUTE].							
		c. Type 'LOAD "EARAUT: C", 10' and press the [EXECUTE] key.							
		 The following eleven pages are flow diagrams for controlling EARAUT. 							























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	MIKULL	.140 .	STATIONS		<u>de le s</u>	<u>61 - 65 - 6</u>		
с.	EAR	UT PF	ROGRAM (No	on-Contro	oller)			
	The subp stat subp	The EARS automatic (EARAUT) non-controller program consists of one subprogram: EARNDC (Central processing program for Non-Controlling stations), in addition to the EARAUT main entry program. These subprograms are loaded in and out of the HP-9845C as needed.						
	The upda disp	funct ites c lays,	tion of EA of plume r , as based	EARAUT as a non-controller is to receive periodic e release parameters, and observe the resulting plume. sed on input from a EARS CONTROL station.				
	EARAUT (Non-controller) can be run in either one of two user can load the STATUS program and wait for one of the stations to log on as the 'CONTROLLER', or the user can EARAUT program and specify a non-controlling mode provid controlling station is logged on.							of two ways. The of the 'CONTROL' er can load the provided the
	1.	 After the computer system at this station has been started up EARAUT can be loaded and run independently of the 'STATUS' program by entering the following commands from the HP-9845C keyboard. 						
		a.	Type in	'SCRATCH	A', pre	ess [EXECU	TE].	
		b.	Type in	'SCRATCH	C', pre	ess [EXECU	TE].	
		c.	Type in key.	'LOAD "E	ARAUT: (C", 10' an	d pres	s the [EXECUTE]
	2.	The EARA	following NUT.	SEVEN p	ages are	e flow dia	igrams '	for non-controlling
	•							



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d. EARMAN PROGRAMS

The EARS Manual (EARMAN) program is the manual version of the EARS programs. All of its functions are performed at the individual HP-9845C stations independent of the operation of the other stations and the HP-1000 at the TSC. Any data input such as MET data or release rate data is manually entered from the keyboard. In addition no data is transmitted to or from a station that is operating EARMAN. EARMAN consists of two separate subprograms: EARMOC (Core subprogram) and EARRDC (Release rate definition subprogram), in addition to the initial entry program EARMAN.

In the event of a hardware failure of the HP-1000 at the TSC and/or the loss of communications between various HP-9845C EARS stations and the HP-1000, EARMAN program can be initiated. Essential data can be obtained by telephone communication via PGandE or PT&T lines with EARS operators at the other 'CONTROLLING STATIONS' (CR, TSC, or EOF).

1. To load and run the EARMAN program type in the following commands from the keyboard.

a. Type in 'SCRATCH A', press [EXECUTE].

b. Type in 'SCRATCH C', press [EXECUTE].

c. Type in 'LOAD "EARMAN: C", 10', and press [EXECUTE].

2. The following nine pages are flow diagrams for EARMAN.

















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e. EARRDC/EARrdc PROGRAMS

The release rate definition program EARRDC/EARrdc is linked by the core program EARMDC/EARADC. Thirteen different release options are available in these programs. The logic for each option is outlined in the following fourteen pages of flow diagrams.

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6. Terms Common to EARAUT and EARMAN

Meteorological Data Input

Meteorological data from the primary and the backup MET towers are sent to the HP-1000 computer at the TSC. Both STATUS and EARAUT programs can 'poll' the HP-1000 for MET data (averaged, previous or current), including wind direction, wind speed, sigma theta, lapse rate, precipitation, and mixing height (provided the data link between this station and the TSC exists).

During a drill run, MET data is read from the HP-1000 drill database.

If EARMAN program is run, the operator has to enter all MET data manually.

Release Estimate

The DCPP Emergency Procedure RB-9 (Ref. 2) is the technical basis for the EARS release rate calculations. The radionuclice distribution and release rate are determined in the EARS subprograms EARrde or EARRDE, using one or more of the following techniques:

- A. Plant vent monitors and vent flow indication.
- B. Containment area monitors and derived release rate based on containment leak rate, etc.
- Isotopic analyses of selected plant containers and systems performed prior to the accident.
- D. Steam line monitors and steam flow rate meters.
- E. Final Safety Analysis Report (FSAR)(Ref. 3) accident scenarios:

-Steam Generator Tube Rupture Accident -Loss of Coolant Accident (LOCA) -Fuel Handling Accident -Control Rod Ejection Accident -Locked Pump Rotor Accident -Loss of Offsite Power Accident -Steam Line Break Accident -Volume Control Tank Rupture Accident -Waste Gas Decay Tank Rupture Accident -Liquid Holdup Tank Rupture Accident

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When using the FSAR cases, the operator must exercise judgement as to whether the 'expected case' or the 'design basis' estimates are appropriate to adequately describe the accident. The DCPP Emergency Procedure RB-11 (Ref. 4) indicates that unless actual release data is available, the operator should initially choose the 'design basis' (more conservative) values in determining initial accident classification.

F. If none of the FSAR accident types is appropriate, the 'Manually Specified Release Rate' or 'Tank or Building Inventory' permits manual entry of radionuclide release data, either by isotope or as total noble gases and iodines.

F.A.G. Table

The Protective Action Guide (PAG) criteria used in the EARS programs are from Table 5.1 of Reference 5. They apply to the total cumulated dose (or dose commitment) from the time of release up to the time of interest. The criteria are:

- 1. No action needed if Whole Body dose <0.5 rem* and Thyroid dose <5 rem.
- Sheltering recommended if Whole Body dose >= 0.5 rem* and Whole Body dose
 <5 rem, or Thyroid dose >=5 rem and Thyroid dose <25 rem.
- Evacuation recommended if Whole Body dose >= 5 Rem or Thyroid dose >= 25 rem.

Projections and Updates

It is possible to run unlimited number of class A 'dose projections' before the first update and between any two subsequent updates, and forty segmented Gaussian modeled, near 'real-time' dose updates. A 'projection' is a straight line Gaussian modeled dispersion and dose calculation which does NOT deposit activities but does take into account previously accumulated doses from updates. An 'update' is a complete set of segmented Gaussian modeled dispersion and dose calculations which disperses and deposits activities along the travelling direction.

In EARMAN operation, at the end of either projection or update calculations, a set of output tables is automatically printed.

*0.5 rem is the PAG criteria set by the State of California.

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Edge Dose Rate

The edge dose rate is the plume exposure rate at the edge of the plume as displayed for the dose type (thyroid or immersion) selected. This is displayed on the right-side of the CRT graphics area. If the edge dose rate value chosen is greater than the plume center dose rate, message "Edge dose rate > Centerline dose rate" is displayed. When a new edge dose rate is chosen, a plume with this new dose rate will be drawn. This is to prevent confusion regarding the parameters selected and the particular plume displayed.

The edge dose rate is always in mrem/hr. The default value in the EARS is 0.1 mrem/hr. It can be changed by pressing the EDGE DOSE TYPE/RATE soft key and entering a new edge dose rate.

Dose Type

Two different dose types can be selected: thyroid or immersion. Whenever a new dose type is selected and a previous plume is already displayed, the new plume will be redrawn for the new dose type.

Radius and Plume Center

The value displayed as '+Radius' on the right-side of the CRT graphics area is the minimum distance in meters from the plume segment center (denoted by a small white cross on the graphics) to the edge of the plume for a given edge dose rate. This marker is used to indicate the 'centers' of the plume segments, starting from the earliest (generally the outermost segment) to the latest segment (generally the innermost or closest to the site). The plume center-line dose rate is indicated in mrem/hr under the '+Center Dose Rate' label on the right-side of the CRT graphics area.

Each time the STEP CENTER soft key is pressed, the white cross will move to the next plume segment center and the corresponding center-line dose rate and radius will change accordingly, cycling from the earliest segment to the latest.

Sector Element

The cumulative deposition data are listed for each of 96 'sector elements'.

A sector element is an area bounded by a division of the compass into 16 sectors (from number 1 centered on North to number 16 on NNW) with radial distances as 800 meters to 2 miles, 2 to 5 miles, 5 to 10 miles, 10 to 15 miles, and 15 to 20 miles.

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Cumulative Deposition

The cumulative deposition listed as Ci/m**2 of 'Cs-137 equivalents' is the quantity of Cs-137 which would yield a direct radiation exposure rate from ground plane deposition equal to the decay-corrected sum of all deposition which has occurred for that period. Due to uncertainties involved in calculating both wet and dry deposition, this information is meant just to provide guidance to field survey teams as to where deposition is likely to have occurred. The values listed have relatively large uncertainties and should be used together with accurate field survey data in determining appropriate protective actions.

Output Tables

The EARS output is listed in tabular forms as:

Table 1 (EARMAN) or Table 1A (EARAUT or STATUS) - MET data (wind speed, wind direction, sigma theta, lapse rate, precipitation, stability classes, and mix height);

Table 1B (EARAUT or STATUS) - PIC data:

Table 1C (EARAUT or STATUS) - RMS data;

Table 2 - Release rate data in Ci/sec;

Table 3 - Emergency status data (projection or update duration, incident and release start times, accident type and any message);

Table 4 (EARMAN) - Plume segment radial intercept (RI) points dose rates and endpoints (EP) dose rates and doses data; A RI point is the intersection of a plume segment centerline with one of the radial rings: 800 m, 2, 5, 10, 15 or 20 miles.

Table 4A (EARAUT) - Plume segment radial intercept (RI) points dose rates data;

Table 4B (EARMAN or EARAUT) - Plume segment centerline endpoint (EP) dose rates data;

Table 5 (EARMAN or EARAUT) - Dose rates, doses and P.A.G.'s at specific locations;

Table 6 (EARMAN or EARAUT) - Deposition data by sector elements.

Table 7 (EARMAN) - Dose equivalent I-131 and Cs-137 release rates, total noble gas release rate and averaged energy released per disintegration.

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7. EARS Support Software

The function of the EARS support programs is to initialize, edit or review the EARS data files. These programs include EAREDT, EARSED, EARSDP, EARKSP, EARKDC and EARDOC, and are all stored on the HP-79C6 disc drive at the stations. These programs are not normally used during emergency conditions.

EAREDT - Data File Edit Program

The EAREDT program is used to setup, edit, or print the fixed data files used by the EARS for system parameters, isotope specific parameters, FSAR release rate data, site boundary locations, fixed PIC locations, RMS parameters, etc. This program can also duplicate from one msus to another all of the data files used by the EARS.

The data files accessed by this program are ERDSYS, ERNRMS, ERRTXY, ERDISO, ERBNDY, ERPLOC, ERNMAP, ERDMET, ERNSTN, ERNMAP, ERSRCE, ERMONI, ERELOC, ERDGRD and ERSTDC.

EARSED - Data String File Edit Program

The EARSED program allows the operator to access the data base to print, edit or initialize the projection and update string data stored on ERDSTA and ERDSTR, respectively. Rather than decoding the strings, this program edits or prints the ASCII characters of the string for each of the parameters. EARSED can also purge old data on ERDSTA or ERDSTR.

EARSDP - Calculational Parameters Plot Program

The EARSDP program allows the operator to print the immersion dose correction factors and to plot sigma y, sigma z and plume depletion curves used in the EARS calculations. Data files accessed by this program are ERDSIG, ERDDEP and ERDIMR.

EARKSP - Soft Key Functions Defining Program

The EARKSP program is used to create and edit the soft key labels used in EARAUT, EARMAN, and STATUS programs. Labels for the soft keys are stored in a string array that is read from a data file on the program mass sotrage media (7906 disc cartridge).

Data files EARSKY, EARACK, and EARKEY are used in program; STATUS, EARAUT, EARMAN, respectively.
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EARKDC - Graphics Documentation Program

The EARKDC program is a documentation program used to describe the CRT screen layout and soft key functions of the EARMAN, EARAUT and STATUS programs.

EARDOC - File Documentation Program

The EARDOC is a documentation program that lists all types of data files . in the HP-9845C software. For each data file or type of data file, the file name, size, contents and general purpose can be listed.

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8. REFERENCES

- 1. "EARS User's Operating Manual for CIRC Station", Rev. 3, July, 1984.
- PGandE: "DCPP Emergency Procedure RB-9 Determination of Release Rates", Rev. 1, 1983.
- 3. PGandE: "DCPP Final Safety Analysis Report", Chapter 15.
- PGandE: "DCPP Emergency Procedure RB-11 Emergency Offsite Dose Calculations", Rev. 1, 1983.
- EPA: "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents"; EPA-520/1-75-001, 1975.

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APPENDIX A

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EARS HARDWARE

The EARS computer hardware at CR, TSC, and EOF EARS stations includes:

MODEL	DESCRIPTION	FUNCTION
HP-9845C	Desktop Computer w/graphics ROM, I/O ROMs, Mass storage ROM, Assembly execution ROM	EARS graphics computer at this station
HP-7906MR	Disc Drive	Mass storage unit
HP-98041A	Disc Interface	Interface the 9845C with the 7906
HP-13037C	Disc Controller	Controls 7906 operation
HP-98036A	Serial Interface (select code 5 at TSC & CR) (select code 4 at EOF)	Interface the 9845C with the modem to the TSC

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APPENDIX B

LOADING HP-9845C INTERNAL PRINTING PAPER

Printer paper is loaded by using the following procedure. To perform the following steps, the computer must be switched "ON".

- 1. Lift or remove the access cover on the top of the printer by pushing down on the raised surface at the rear of the door. The door can be removed by lifting up and pulling it toward you. It is reinstalled by placing it on the hinge pins and pushing until it snaps into place.
- Remove and discard the paper core of any previous roll. If the remaining roll is small and a new roll is to be used, remove the old roll by:
 - Unrolling and lifting it upwards until the roll is above the printer, then,
 - b. Holding the roll firmly and pulling it upward and forward; the paper guide will tear the paper off.
- 3. If any paper remains in the printer mechanism, remove it by pressing the PAPER ADVANCE key until the paper stops moving.
- Remove the first layer of paper from a new roll. Be sure the paper has a cleanly torn or cut edge, as paper with a ragged edge may not load properly. The corners can be folded back to form a point for easier loading.
- Insert the new roll such that the free end is positioned as shown. Press the PAPER ADVANCE key until paper appears at the front of the printer, then close the access door.

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sco		ORTANT TO	ALITY
Nur aft des The are	reg 0737 requires samples to be taken and analyzed w ter the decision is made to take a sample. This pro signed to ensure safe and reliable methods to meet t e samples that will be collected and analyzed from t e as follows:	ithin 3 hours cedure is his requirement his procedure	s ent. e
1.	For RC (Reactor Coolant) Samples:		
	a. In-line pressurized flask with off-gasing fo	r:	
	1) Gas Chromatograph Analysis		
	2) Diluted stripped gas samples for isotop	ic analysis	
	b. Diluted RC samples for		
	1) Boron analysis		
	2) Isotopic Analysis		
2.	For CA (Containment Air) Samples:		
	a. Diluted CA samples for isotopic analysis		
	b. Gas Chromatograph Analysis		
This Sent init of s exet any on t as	s general procedure is made up of 7 specific procedu try access/egress, the steps to obtain the required tial sample exercise following an accident and dispo samples. This procedure may be used again for subse rcises if the same information is required at a late other type of a sample, procedure EP RB-16 will giv the types of sample and the various analyses that ca well as the specified procedures for obtaining sampl	ires detailin samples for osal or stora quent sample r time. For e full detai n be perform es.	g ge ls ed
This requ	s procedure and the procedure listed below, and chan uire PSRC review.	ges thereto,	

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DIABLO CANYON POWER PLANT	UNIT NO(S) 1 AND 2	NUMBER EP RB-15 REVISION O DATE 7/14/84 PAGE 2 OF 2
TITLE SENTRY POST ACCIDE SYSTEM INITIAL SAM	NT SAMPLING PLING EXERCISE AFTER AN ACCIDIENT	
PROCEDURE		
1. Specific Proce	dures	
The detailed i the Scope of t sub-procedures	nstructions for performing the sampl his procedure are covered in the fol :	ing outlined in lowing
EP RB-15:A	Sentry Lab Access/Egress and Initi During an Emergency	al Actions
	This procedure details necessary s accessing and egressing the lab, G Chromatograph startup, initial sys annunciator testing prior to the f exercise during an accident.	teps for as tem lineup, and irst sample
EP RB-15:B	Reactor Coolant Sampling	
	This procedure details the steps r sampling any one of 5 different sa and obtaining a stripped gas sampl available for gas chromatographic	equired for mple sources e and making analysis.
EP RB-15:C	Containment Air Sampling	
	This procedure details the steps r containment air available for gas analysis and to dilute containment isotopic analysis.	equired to make chromatographic air for
EP RB-15:D	Gas Chromatographic Hydrogen Analy	sis
	This procedure details the steps r check the instrument calibration p analysis and then (2) to load and sample from the RC module of the L the CASP. Sample gas should be av RC-V-15 before using this procedure	equired (1) to rior to sample analyze a gas SP or from ailable at e.
EP RB-15:E	Post-Accident RCS Liquid and Gas S	ample Handling
	This procedure details the steps r prepare (1) a diluted liquid sample analysis, (2) a diluted off-gas sam isotopic analysis (3) a diluted lin isotopic analysis, and (4) a dilute air sample for isotopic analysis.	equired to e for boron mple for quid sample for ed containment
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TITLE SENTRY POST ACCIDENT SAMPLING SYSTEM INITIAL SAMPLING EXERCISE AFTER AN ACCIDIENT

EP RB-15:F -- Data Analysis

This procedure provides a standard format to record data obtained in the EP RB-15 procedures.

EP RB-15:G -- Sample Storage and Disposal

This procedure provides a means for disposal of stripped gas samples and storage of RCS liquid samples.

REFERENCES

- Sentry High Radiation Sampling System Operations and Maintenance Manual
- 2. EP RB-16
- 3. Nureg 0737

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PC	Pacific Gas and Electric Company	NUMBER EP RB-15:A REVISION O
0	DEPARTMENT OF NUCLEAR PLANT OPERATIONS	DATE 7/14/84
U	DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 EMERGENCY OPERATING PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM TITLE INITIAL ACTIONS DURING AN EMERGENCY	PAGE 1 OF 20
₽ 	APPROVED R. C. Thomber PLANT MANAGER	7-27-84 DATE
	IM	PORTANT TO

PURPOSE

ENVIRONMENTAL QUALITY

The purpose of this procedure is to define some of the actions taken when a decision is made by the Site Emergency Coordinator to obtain a post accident sample using the Post Accident Sample System (PASS).

This procedure guides, with consideration of plant emergency radiation hazards, the Sentry team to access and make operable the Sentry room. It also guides the team to withdraw from the Sentry room upon sample acquisition. This procedure and changes thereto requires PSRC approval.

DISCUSSION

This procedure ensures sample recovery with a minimum risk to personnel in a limited time frame.

The movable shield at the south entrance of the Sentry Room should normally block that access route. Therefore ingress and egress may be required across the RCA boundary. Performance of this procedure may require the transfer of radioactive samples to non-RCA's. For these reasons this procedure involves exemptions from certain routine RCA access requirements. Personnel implementing this procedure should be covered by an SWP during an accident, drill, or drill-like training. Routine use of the Sentry room is covered by the C&RP routine sampling RWP.

Particularly hazardous or unexpected conditions may occur in post accident situations. Direction by appropriate supervision may augment or supercede portions of this procedure because every possibility cannot be anticipated.

1 AND 2

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TITLE

SENTRY POST-ACCIDENT SAMPLING SYSTEM -- INITIAL ACTIONS DURING AN EMERGENCY

PREREQUISITES AND PRECAUTIONS

- The Site Emergency Coordinator should pre-plan post-accident sampling with the Emergency Radiological Advisor and the Site Chemical and Radiation Protection Coordinator prior to ordering a plant entry (i.e., prior to deciding to collect a post-accident sample) when unusually hazardous radiation or contamination levels are known or suspected to exist.
- A sufficient number of properly qualified personnel to complete the task should be available prior to making the post accident sample decision. This might include:
 - a. Two people on the Sentry team; one of whom is a qualified C&RP Technician and the other an Unescorted Radiation Worker.
 - b. A sample transporter qualified as a C&RP Technician.
 - c. A count room qualified person in the TSC lab.
- The Work Permit will specify protective equipment. Unless conditions warrant less stringent requirements, it is suggested that full PC's, SCBA's and accident dosimetry be worn.
- 4. The Sentry team will make a post-accident entry to the plant only when directed by supervision and when possessing a high range portable survey meter to permit surveying into areas of unknown radiological conditions.
- The Sentry team should be informed of plant status as it pertains to significant hazards, both radiological and non-radiological, along access routes.
- Exposure hazards, both airborne and direct radiation, in the Sentry room should be monitored remotely for pre-entry status and locally for tracking while sampling.
 - a. Use the Eberline Control Terminal(s) in either Access Control or the cold machine shop to remotely address the SPING air monitor in the Sentry room, which can be read locally.

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TITLE SENTRY POST-ACCIDENT SAMPLING SYSTEM -- INITIAL ACTIONS DURING AN EMERGENCY

- b. Area radiation monitor RE-48, in the Sentry room, can be read in the Control Room or locally.
- Communications are vital during a plant emergency. Entry teams must be able to communicate with the Control Room and appropriate supervision.
- 8. C&RP Technicians have the AC4 N key required for access to areas and equipment related to this procedure and have security key cards to enter door #116. If the Sentry team does not possess either of these then take the applicable master keys located in the lock box in the R.P. office. The key to the 85' elev. post-accident equipment locker is number 37, located in the key cabinet in the R.P. office.
- 9. The containment isolation valves FCV-696, 697, 698, 699 and 700 are controlled from the Containment Isolation Valve Panel in the Sentry Room only. These switches require a key to operate. Keys are located in the Control Room, R.P. office, and in the Sentry room in a keybox with a breakable glass cover. These valves are to be opened only during an emergency or for testing.
- It is important to conduct operations in an expeditious manner to provide timely vital plant status information.

PROCEDURE

1. Access to Sentry Room Area

The Diablo Canyon Shielding Review indicates that the following routes might minimize exposures.

a. Via Turbine Building at 85' Elevation

Starting at the Cold Machine Shop proceed into the hallway to door #125C, proceed north to door #122 and exit building. From here turn south and enter door #192 to the Motor Repair Shop.





The Figure 1 pathway is preferred. However an access route other than those above may be suggested by actual post accident conditions (e.g., fire, high energy line break, etc.). The final route selected should be directed by appropriate supervisory personnel.

2. Initial Set-up of Sentry Room Equipment

a. Gas Supply Cylinders Check

The gas supply cylinders for Sentry Room equipment are located along the east wall of the Motor Repair Shop. Proceed to the gas storage rack and verify the following:

- The cylinder valves are fully open for all three cylinders.
- The manifold valves are fully open for all three cylinders.

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DIABLO	NUMBER EP RB-15:A REVISION O DATE 7/14/84 PAGE 6 OF 20				
TITLE	SENTR IN	Y POSTITIAL	ACTION	DENT SAMPLING SYSTEM	
		3)	The a appro psig.	irgon regulator shows tank pressure eximately 1000 psig and the regula	e of tor is set to 100
			NOTE	If argon tank pressure is much psig, then the cylinder has to b the spare cylinder located at the	less than 1000 be changed with he storage rack.
		4)	The 2 at le 10 ps	2000 ppm and 10% H ₂ span gas cylind ast 100 psig and both regulators : ig.	ders should have should be set at
	b.	Emer vent Door	rgency tilation r Closu	Ventilation System Line-up. (Option is lined up proceed to step 2.c.	ional. If proper ., Steel Shield
		1)	Climb venti	the ladder to the cat walk and control to the ladder to the cat walk and control lation room. (AC4 N key required)	rocs to enter the).
		NOTE	: Min	imize the time that the vent room	doors are open.
		2)	Proce	ed to breaker panel PPHRS, 52-12J- ers ON.	-35 and check all
		3)	Proce locat STOP	ed to the motor controllers for fa ed to the left of the breaker pane and RESET pushbutton on each one.	ans and heaters and push the
		4)	EMER	LEAD (IS-150) is the preferred sys	stem.
			a)	Open its supply and exhaust damper and exhaust vent dampers (a total and close all other dampers.	rs and the supply of 4 dampers)
			b)	Push the START pushbuttons on the controllers for the EMER LEAD supp fan, and heater 29A, in that order	motor bly fan, exhaust
		5)	EMER	REDUN (IS-151) is to be used as a is inoperable.	backup if EMER
			a)	Open its supply and exhaust damper and exhaust vent dampers and close dampers.	s and the supply all other

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DIABLO CAN	IYON P	OWER	PLANT UNIT NO(S) 1 AND 2 REVISION DATE PAGE	EP RB-15:A 0 7/14/84 7 OF 20
TITLE	SENTR	Y POST	ACTIONS DURING AN EMERGENCY	•
			 b) Push the START pushbutton on the motor control for the EMER REDUN supply fan, exhaust fan and heater 29B, in that order. 	llers
		6)	Return to the Motor Repair Shop.	
	c.	Stee is c	el Shield Door Closure. (Optional. If the shield do closed proceed to step 2.d., Radiological Assessment.)
		1)	Proceed through door #192-A south of the Motor Repa Shop and visually check the shield door's winch cat If the marked portion of the cable indicates the sh is closed return to the Motor Repair Shop and proce with step d., Radiological Assessment below.	nir Die. Dield Ded
		2)	Quickly pass through the Motor Repair Shop and the Sentry room. Remove the cover plate from the door' pathway and return to the cable winch area.	s
		3)	Operate the winch until the marked portion of the c visibly indicates the shield door is closed.	able
		4)	Return to the Motor Repair Shop.	
	d.	Radi	ological Assessment of Sentry Room	
		1)	Enter the Sentry room via door #116 (an RCA boundar and the watertight door (AC4 N padlock).	·y)
		2)	Perform a general area radiation survey	
			 Note high levels such as might exist at the so end of the room due to ECCS piping. 	uth
			 b) Note low level areas for sample screen surveyi later. 	ng
		3)	Note the reading of RE-48 on the Process Control Pa (PCP). Recheck it intermittently.	nel
		4)	Monitor airborne radioactivity using the SPING. If airborne levels permit the respirator, if worn, may removed at this time. It should be donned anytime there is a potential for airborne contamination to introduced into the room.	be be

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DIABLO CANYO	NUMBER PLANT UNIT NO(S) 1 AND 2 NUMBER EP RB-15 REVISION 0 DATE 7/14/84 PAGE 8 OF 2							
TITLE SENTRY POST-ACCIDENT SAMPLING SYSTEM INITIAL ACTIONS DURING AN EMERGENCY								
	e. Proc	ceed to the Ventilation Control Panel.						
	1)	Check the alarms.						
		 Press TEST and note the red alarm indicators flash while the audible alarm sounds. 						
		b) Press SILENCE to stop the audible alarm.						
		c) Press ACK and note the flashing alarm indicators glow steadily.						
		 d) Press RESET and note the red alarm indicators go out. 						
	2)	If the NORMAL VENT switch is on, turn it off.						
	3)	If the EMER LEAD ventilation system is desired and is not operating depress in order the SUPPLY, EXHAUST, and HEATER pushbuttons.						
	4)	Observe the appropriate indicating lights for proper operation of the desired ventilation line-up.						
	5)	If necessary, return to step 2.b., Emergency Ventilation Line-up.						
	f. Con	tainment Atmosphere Sample Line Heating						
	1)	Proceed to the CCP and position the FUNCTION SELECT from OFF to SF1-3/GGD.						
	2)	Observe the following:						
		a) The POWER ON indicator lights.						
		 b) The flow monitor 20% and 100% flow lights turn on for approximately 25 seconds. 						
	3)	Press the PILOT LIGHT TEST pushbutton and note which lights are not functional.						
	4)	Turn the HEAT TRACE POWER SWITCH to the ON position.						
	5)	Place the temperature select switches for EHT 196 and EHT 197 to the down position marked 260°.						
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DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2								EP RB-15:A 0 7/14/84 9 OF 20
TITLE	INITIAL	ACTI	IDENT SAM	IG AN EMER	STEM			
	g. Rea	ar Pan	el Access	Rolling	Shield Close	ure.		
	If Ele	the particular	anel roll al Line-u	ing shiel p.	d is closed	proce	ed to step 3	.,
	1)	Pers	form this elded pan	valve li els:	ne-up check	in th	e rear of the	•
		CAP-	-V-13 CLO	SED (abov	e the GC)			[]
		CAP-	-V-31 OPE	N (adjace	nt to the GO	c)		[]
		CAP-	-V-32 OPE	N (adjace	nt to the GO	:)		[]
		CASE	P-V-1 OPE	N (overhe supply	ad on cont. line)	atmos	•	[]
		CASE	-V-2 OPE	N (lower	part of CASP)		[]
		CASP	-V-3 OPE	N (mid pa	rt of CASP)			[]
	2)	Get to t pad	the come the pad e eye on the	-a-long f ye on the ne door.	rom the cabi east wall a	net ar nd the	nd attach one e other to th	end
	3)	Oper bloc	ate the o king the	doorway.	ng urtil the	rolli	ing shield is	
3.	Electric	al Lin	e-up					
	Proceed Control	to the Panel,	breaker and chec	panel Pyl	NMII, locate	d left ers as	of the Vent follows:	
	BKR	#1 -	ON	[]	BKR #2	- 01	[]	
	BKR	#3 -	ON	[]	BKR #4	- ON	[]	
	BKR	#5 -	OFF	[]	BKR #6	- ON	[]	
	BKR	#7 -	ON	[]	BKR #8	- ON	[]	
	BKR	#9 -	ON	[]	BKR #10	- OF	F[]	
	BKR	#11 -	OFF	[]	BKR #12	- ON	[]	

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DIABLO CANYON POWER PLANT	UNIT NO(S) 1 AND 2	NUMB REVI DATE PAGE	ER SION	EP RB-15:A 0 7/14/84 10 OF 20
TITLE SENTRY POST-ACC INITIAL ACTIN	IDENT SAMPLING SYSTEM ONS DURING AN EMERGENCY			
4. The Containme	nt Atmosphere Hydrogen Analyzers			
The two redum PCP and the C controlling the The reagent g Sentry Room.	dant analyzer systems' remote panels MP. Beneath each panel are the swit he three sample line containment iso as tank (oxygen) is against the sout	s are be tches fo plation th wall	tweer valve of th	the s. ne
a. Initial	Conditions of an Analyzer System			
1) Mai	n power switch at remote panel in S	TANDEY.		[]
<u>NOT</u>	E: If the power switch is OFF, then STANDBY and give the system six up. If both systems have not be for at least six hours, or are of inoperable, use the gas chromato below. Record the time of switch STANDBY	n turn i hours t een in S otherwis ograph, ching fr	t to o war TANDE e step om OF	5, F to
2) Sol val 238	enoid operated sample line containme ve switches CLOSED. (FCV-235, 236, , 239, 240)	ent isol 237,	ation	[]
3) Oxy clo	gen gas tank connected and isolation sed. (Tank should be changed at 10)	n valve D psig)		[]
b. H ₂ Analy	zer System(s) Operation.	CEL:	82	83
1) Tur to pos	n the three sample line switches the OPEN position. Observe the ition indicating lights.		[]	[]
2) Ope and	n the oxygen tank isolation valve adjust regulator to 27 ± 2 psig.		[]	[]
3) Tur STA	n the main power switch from NDBY to ANALYZE.		[]	[]
4) Pus to	h the REMOTE SELECTOR pushbutton gain control at this panel.		[]	[]
5) Tur 0-1	n the dual range switch to the 0% range.		[]	[]

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DIABLO CANYON POWER	NUMBER EP RB- REVISION O DATE 7/14/E PAGE 11 OF		
INITIAL	ACTIONS DURING AN EMERGENCY		
6)	Adjust the ZERO and SPAN potentiometers until they agree with their respective values indicatedon calibration stickers located under each potentiometer.	[]	[]
7)	Turn the function selector switch to SAMPLE. TIME <u>(82) (83)</u>	[]	[]
8)	If both CEL 82 and 83 are to be used, repeat steps 4.b.1) to 7) for the second system while waiting for the first system to stabilize, which takes approximately 6 minutes.	[]	[]
9)	Proceed with step 6., Initial Valve Line while waiting for stabilization. When 6 minutes have elapsed since switching to SAMPLE, continue with step 10) below.	Up,	[]
10)	Record the analyzer meter reading, the time read, and the scale used. Meter Reading (%) Time Scale Used	me []	[]
	NOTE: If the meter reads greater than 9% the 0-20% scale should be used.		
11)	Inform the Control Roam of which scale and CEL is used and ask the Control Room if the analyzer(s) are to remain in ANALYZE or be returned to STANDBY.	[]	[]
	NOTE: Advise the Control Room of the reagent gas depletion and the limited lifetime of the sample pumps, which are located in the 100' El. GE area.		
12)	If directed to leave the analyzer(s) in ANALYZE proceed with step 5, CMP/CAP Power Up	[]	[]

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DIABLO CA	NYON PO	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE PAGE	EP RB-15:A 0 7/14/84 12 OF 20
TITLE	SENTRY			
	с.	Standby		
		 Turn the function selector to ZERO and purge the analyzer for 6 minutes. 	[]	[]
		2) Turn the main power switch to STANDBY.	[]	[]
		3) Close the reagent tank isolation valve.	[]	[]
		 Turn the three sample line isolation valve switches to the CLOSED position. 	[]	[]
4		5) Push Common Alarm to Reset	[]	[]
5.	CMP/	CAP Power Up/Gas Chromatograph Startup (Optiona	1)	
	a.	Check the three root valve handles next to the CAP down in the vertical position to allow Argon and the Span gases to the CAP.	,	[]
	b.	Open or check open CAP-V-10 and adjust instrument air pressure to 80 ± 2 psig.		[]
	c.	Open or check open CAP-V-14 and adjust argon pressure to 40 \pm 1 psig.		[]
	d.	At the CMP, turn the POWER switch to ON and ensure the red power light and the G.C.'s red colon are on.		[]
	e.	On the G.C. front panel		
		 Select attenuation factor of 250 (25 x 10 Place all function switches in the OFF (out) position.)).	[]
		2) Depress MAN and CLEAR switches.		[]
		3) Enter "00" initiating G.C. warmup. Time	on	
6.	Init	ial Valve Lineup		
	a.	Unlock the cabinet door and the drawer lock ba counter, if locked.	r under th	ne
		 Locate a loaded filter assembly for the c sample. 	containment	: air

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TITLE SEN			PAC	E SE	7/14/84 13 OF 20
	TRY POST	ACTIO	DENT SAMPLING SYSTEM NS DURING AN EMERGENCY		
	2)	Loca	te wrenches, labels, and bags.		
b	. Valv shou	HCV d be	-21, which is located next to the chemica positioned to the TO CONTAINMENT positio	l sink, on.	[]
c	. Samp indi	le co icator	oler water valve should be turned until shows OPEN		[]
d	. At t	the CA	SP	1	:]
	.)	Inst	all a loaded filter assembly into the ainment air dilution system.	1	:]
		The be of fitt	tubing end with the blue dab of paint on n the bottom. Tighten but do not damage ings. Retighten if leakage is noted late	it shoul the r.	ld
	2)	CASP	cart/cask connection for pressure indica	tion.	
		a)	Engage and lock a cart/cask on its quick-disconnects.	[:]
		b)	OPEN the INLET and OUTLET valves and CLO the BYPASS valve on the engaged cart/cas	SE k. [:]
		c)	Connect PI-1109 (an MBIS pressure monito the engaged cart/cask. Plug it in and t	r) to urn	
			Cart/Cask	ask. []
	3)	Check	that PI-1116 is plugged in and turn it	on. []
	4)	Close	or check closed CASP-V-17.	[]

DIABLO CANYON POWER	R PLANT UNIT NO	D(S) 1 AND :	2		NUMBER REVISION DATE PAGE	EP RB-15:A 0 7/14/84 14 OF 20
TITLE SENTRY PO	ST-ACCIDENT L ACTIONS DU	SAMPLING SYSTEM RING AN EMERGEN	MNCY			
5)	Align CAS	P-V-16 to the (CASP-DV-1 p	osition		[]
6)	Align CAS	P-DV-1 to CASP.	-SF-5 posit	ion.		[]
7)	Install a	new septum on	CASP-SF-5.			[]
e. At	the CCP:					
1)	Adjust N on CCP-G1	pressure regui	lator to 10	0 psig	as indicat	ed []
	NOTE: Th ed so	is pressure wil uctor is on and und.	11 drop to 1 Low N ₂ PR	80 psig ESS ala	when the rm will	
2)	All 11 of CLOSED:	the CCP 3 post	ition valve	switch	es should	be
	AV-1	[]	SV-4.1	[]		
	SV-1.2	[]	SV-4.2	[]		
	SV-2.1	[]	SV-5	[]		
	SV-2.2	[]	AV-2	[]		
	SV-3.1	[]	SV-10	[]		
	SV-3.2	[]				
3)	The EXERC Verify re	ISE STOP buttor d light in knot	should be is on.	in the	IN positi	on. []
4)	Annunciato	or Test				
	a) Push	and hold the 1	EST button	and ve	rify:	
	(1)	the alarm sour	ds.			[]
	(2)	all labeled wi SAMPLE FLASK w	ndows flas indow which	h excep h glows	t ISOLATE steady.	[]

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DIABLO CA	NYON P	OWER PLANT	UNIT NO(S)	1 AND 2	NUMBER REVISION DATE PAGE	EP RB-15:A 0 7/14/84 15 OF 20
TITLE	SENTR	Y POST-ACC	IDENT SAMPI	AN EMERGENCY		•
		b)	Release 1 ISOLATE 1	the TEST button and veri SAMPLE FLASK window goes	fy that the off.	[]
		c)	Push the	ACK button and verify:		
			(1) the	alarm is silenced.		11
			(2) the	3 upper windows alow ste	adu	r 7
		d)	Push the windows a	RESET button and verify are off.	that all	11
	f.	At the P(operated	OST LOCA CM valve swit	NT ISOLATION PANEL all fi tches should be CLOSED.	ve key	
	g.	At the C	AP, valves	should be positioned as	follows:	
		CAP-V-12	(open)			r 1
		Adjust ni	itrogen reg	ulator until nitrogen		
		pressure	gauge is 6	0 ± 2 psig.		r 1
		CAP-V-7	(YSI OXYGE	N ANAL.)		11
		CAP-V-8	(open)			11
		CAP-V-6	(OXYGEN CA	LIB. SOL'N)		11
		CAP-V-5	(CLOSED)			11
		CAP-V-2	(open)			r 1
		CAP-V-1	(open)			r i
		CAP-V-29	(12 o'cloc	k)		[]
		CAP-V-28	(12 o'cloc	k)		r i
		CAP-V-27	(12 o'cloc	k)		1
		CAP-V-9	(closed)			r i
		CAP-V-15	(closed)			11
		CAP-V-16	(closed)			r i
		CAP-V-26	(closed)			[]
		CAP-V-30	(9 o'clock)		[]
		CAP-V-25	(closed)			[]
		CAP-V-20	(closed			[]
		CAP-V-19	(closed)			[]
		CAP-V-18	(closed)			[]
		CAP-V-11	(open)			[]

DIABLO	CANYON P	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-15:A REVISION O DATE 7/14/84 PAGE 16 OF 20
TITLE	SENTR	Y POST-ACCIDENT SAMPLING SYSTEM ITIAL ACTIONS DURING AN EMERGENCY	
	h.	At the Demin Module of the LSP, valves should be positioned as follows:	d
		DM-V-1.1 (closed)	[]
		DM-V-1.2 (closed)	[]
		DM-V-1.3 (closed)	[]
		DM-V-3 (closed)	[]
		DM-VREL-1.1 (closed)	[]
		DM-VREL-1.2 (closed)	[]
		DM-VREL-1.3 (closed)	[]
	i.	At the Open Grab Sample panel of the LSP, val should be positioned as follows:	lves
		RW-V-6 (closed)	[]
		DM-V-2.1 (closed)	[]
		DM-V-2.2 (closed)	[]
		MC-V-2.3 (closed)	[]
		RC-V-17 (closed)	[]
		RC-V-6.1 (closed)	[]
		RC-V-6.2 (closed)	[]
		RC-V-5.1 (closed)	[]
		RC-V-5.2 (closed)	[]
	j.	At the RC Module of the LSP, valves should be positioned as follows:	•
		RC-V-12 (12 o'clock)	[]
		RC-V-15 (CLOSED)	[]
		RC-V-14 (closed)	[]
		RC-V-13 (9 o'clock)	[]
		RC-V-10 (9 o'clock)	[]
		RC-V-11 (CLOSED)	[]
		RC-DV-2 (9 o'clock)	[]
		RC-VREL-1 (closed)	[]
1	000109	RC-VREL-1 (closed)	î ĵ

DIABLO	SENTE	OWER PLAN	TUNIT NO(S) 1	AND 2	NUMBER EP RB-15:/ REVISION O DATE 7/14/84 PAGE 17 OF 20
TITLE	IN	ITIAL ACT	IONS DURING AN EI	MERGENCY	
		RC-VREL-	-2 (closed)		[]
		RC-V-3	(closed)		[]
		RC-V-7	(9 o'clock)		[]
		RC-V-2	(closed)		[]
		RC-V-1.1	(closed)		[]
		RC-V-1.2	(closed)		[]
		RC-V-1.3	(closed)		r i
		RC-V-1.4	(closed)		[]
		RC-V-1.5	(closed)		[]
		RC-V-4	(closed)	분위한 것은 사람들 것을	[]
		RC-V-8.1	(closed)		[]
		RC-V-8.2	(closed)		[]
		RC-V-16	(closed)		[]
		RC-V-9	(CLOSED)		[]
		RC-V-18	(6 o'clock)		Ĺ Ĵ
		RC-V-19	(BYPASS)		[]
		RC-V-20	(closed)		[]
		RC-V-21	(closed)		()
		RC-DV-1	(BYPASS)		[]
		RC-22	(TO WASTE)		[]
	k.	At the R position	W Module of the ed as follows:	LSP, valves should be	
		RW-V-9	(closed)		[]
		RW-V-10	(closed)		[]
		RW-DV-1	(BYPASS)		[]
		RW-V-8	(BYPASS)		[]
		RW-V-7	(BYPASS)		[]
		RW-V-5	(6 o'clock)		[]
		RW-V-4	(closed)		[]
		RW-V-3	(closed)		[]

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DIABLO O	SENTRY POST-ACCIDENT SAMPLING SYSTEM INITIAL ACTIONS DURING AN EMERGENCY	NUMBER EP RB-15:A REVISION 0 DATE 7/14/84 PAGE 18 OF 20
	RW-V-1.1 (12 p'clock)	
	RW-V-1.2 (12 o'clock)	r i
	RW-V-1.3 (12 o'clock)	r i
	RW-V-2.1 (6 o'clock)	r i
	RW-V-2.2 (6 o'clock)	[]
	RW-V-2.3 (6 o'clock)	[]
	1. At the PROCESS CONTROL PANEL (PCP)	
	NOTE: Notify the Control Room when any changed.	valve alignments are
	 Position or check the position of t switches for valves: 	he following
	FCV-9351A (CLOSE)	[]
	FCV-9351B (CLOSE)	[]
	FCV-9350B (CLOSE)	[]
	FCV-9350A (CLOSE)	[]
	FCV-9353A (CLOSE)	[]
	FCV-9353B (CLOSE)	[]
	FCV-692 (CLOSE)	[]
	FCV-693 (CLOSE)	[]
	FCV-694 (CLOSE)	[]
	FCV-1413 (CLOSE)	[]
	FCV-1416 (CLOSE)	[]
	FCV-1417 (CLOSE)	[]
	FCV-1418 (CLOSE)	[]
	FCV-1419 (CLOSE)	[]
	FCV-1412 (CLOSE)	[]
	FCV-1410 (CLOSE)	[]
	FCV-1411 (CLOSE)	[]
	FCV-1414 (CLOSE)	[]

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1

TITLE SENTRY POS	PLANT UNIT NO(S) 1 AND 2 T-ACCIDENT SAMPLING SYSTEM ACTIONS DURING AN EMERGENCY	A PA	MBER EP RB-15:A VISION O TE 7/14/84 GE 19 OF 20
	FCV-1415 (CLOSE)		r 1
	FCV-1420 (CLOSE)		r 1
	FCV-1421 (CLOSE)		11
	FCV-1422 (CLOSE)		r i
	FCV-1423 (CLOSE)		r i
	FCV-1424 (CLOSE)		[]
	FCV-1425 (CLOSE)		[]
	FCV-624 (CLOSE)		[]
	FCV-1428 (POST LOCA SAMPL	ING)	[]
2)	Position switches for POST TRANSFER PUMPS 1 and 2 to	LOCA COLLECTION TA the STOP position.	INK []
3)	Sample Source Valves		
	 a) Determine which sampl will have to be opene 	e source isolation d from the list bel	valves ow:
	SAMPLE SOURCE	CONTAINMENT ISOLAT	ION VALVES
	Hot Legs Loops 1 and 4 Pressurizer Steam Space Pressurizer Liquid Space RHR Pumps Discharge Volume Control Tank	FCV-9356A and FCV- FCV-9354A and FCV- FCV-9355A and FCV- N/A N/A	9356B 9354B 9355B
	 b) Call the Control Room open the appropriate 	and have operation containment isolati	s block on valves.
	 c) Open the correspondin valve (RPIV), remote (RSIV), and remote fl the PCP (see attachme 	g remote plant isol source isolation va ush isolation valve nt 1 for proper val	ation lve (RFIV) at ve).
	d) Allow remote sampling	purging for at lea	st 20

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DIABLO	CANYON POWER	PLANT	UNIT NO	(S)	1 AND 2	NUMBER REVISION DATE PAGE	EP RB-15:A 0 7/14/84 20 OF 20
TITLE	SENTRY POS	ACTIO	IDENT S	AMPI	LING SYSTEM AN EMERGENCY		
	4)	At 1	the PCP		I		
		a)	Push	the	TEST button and verify:		
			(1)	the	alarm sounds		[]
			(2)	a11	labeled windows flash		[]
		b)	Push	the	ACK button and verify:		
			(1)	the	alarm is silenced		[]
			(2)	a11	labeled windows glow steady	,	[]
		c)	Push all w	the	RESET button and verify that ows are off.	it	[]

9. Sampling may now commence.

Page 1 of 1

PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

TITLE: VALVES FOR OBTAINING SAMPLES FROM REACTOR COOLANT

1

ATTACHMENT 1

SAMPLE SOURCE	REMOTE PLANT ISOLATION VALVE (RPIV)	REMOTE SOURCE ISOLATION VALVE (RSIV)	REMOVE FLUSH ISOLATION VALVE (RFIV)	LSP SAMPLE SOURCE VALVE (SSV)
RC Hot Leg 1	FCV-9351 A	FCV-692	FCV-1416	RC-V-1.1
RC Hot Leg 4	FCV-9351 B	FCV-692	FCV-1416	RC-V-1.1
PZR Liquid	FCV-9350 B	FCV-693	FCV-1417	RC-V-1.2
PZR Steam	FCV-9350 A	FCV-694	FCV-1418	RC-V-1.3
P'R Pump 1-1 Discharge	FCV-9353 A	FCV-1413	FCV-1419	RC-V-1.4
RHR Pump 1-2 Discharge	FCV-9353 A	FCV-1413	FCV-1419	RC-V-1.4
VCT Liquid	N/A	FCV-1412	FCV-1420	RC-V-1.5

PG	DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 EMERGENCY PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM REAC	NUMBER EP RB-15:B REVISION O DATE 7/16/84 PAGE 1 OF 11			
0	APPROVED R. C. Thombuy PLANT MANAGER	<u>7-27-84</u> DATE			
DISC		PORTANT TO			
The samp proc for and the line	purpose of this procedure is to detail the steps ole liquid and to strip gas from the reactor coola edure will further detail the steps required to p H ₂ analysis. This procedure requires operations CMP panels. A complete flush of the modules will sample has been processed and system will be retu- up status.	required to int. This prepare a sample at the LSP, CAP, be done after irned to initial			
PREF	EQUISITES				
1.	System was initially lined up as described in procedure EP RB-15:A.				
2.	Verify that the following annunciator windows ar	e off on the PCP:			
	a. REACTOR COOLANT SAMPLE COOLING WATER LOW FL	OW			
	b. REACTOR COOLANT SAMPLE COOLING WATER LOW PR	ESS			
	c. REACTOR COOLANT SAMPLE COOLING WATER HIGH T	EMP			
	d. REACTOR COOLANT PURGE HIGH TEMP				
	e. REACTOR COOLANT SAMPLE WATER HIGH TEMP				
	F. LIQUID SAMPLE PANEL HIGH PLENUM PRESS				
	g. CHEM ANALYSIS PANEL HIGH PLENUM PRESS				
3.	The following equipment must be available and op	erational:			
	a. Meter-long reach rod				
	b. Hand operated vacuum pump				

 SENTRY POST-ACCIDENT SAMPLING SYSTEM REACTOR COOLANT SAMPLING (STRIPPED-GAS AND DILUTED RCS) c. Gas bottle griptong d. Sample cart/cask e. A pre-labeled 60 ml sample bottle with a new septum and 14 cc gas sample bottle. <u>NOTE</u>: The labels should have the sample source, date, estimated time of the sample, and the initials of the person taking the sample. (From this point estimate 2C minutes) 4. The gas chromatograph must be in a standby mode with a valid calibration. Assign one LSP operator to EP RB-15:D to prepare the GC. <u>PRECAUTIONS</u> 1. See EP RB-15:A for details. 2. This sampling involves processing of water that will be highly radioactive. Precautions should be limited to that necessary to perform the required operations. During purge and flush period, it may not be necessary to stand near the panels and consideration should be given to moving to a low dose area. 4. A dose rate instrument should be on and periodic monitoring is suggested during purge and sampling exercises. 5. The LSP operator must verify that the gas chromatograph is ready to receive a gas sample before opening valve RC-V-15. Valve RC-V-15 must be closed after filling all G.C. sample loops and prior to performing diluted gas sampling and final flushing operations. 		ANY	ON POWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-15 REVISION O DATE 7/16/84 PAGE 2 OF 1				
 c. Gas bottle griptong d. Sample cart/cask e. A pre-labeled 60 ml sample bottle with a new septum and 14 cc gas sample bottle. MOTE: The labels should have the sample source, date, estimated time of the sample, and the initials of the person taking the sample. (From this point estimate 2C minutes) 4. The gas chromatograph must be in a standby mode with a valid calibration. Assign one LSP operator to EP RB-15:D to prepare the GC. PRECAUTIONS 1. See EP RB-15:A for details. 2. This sampling involves processing of water that will be highly radioactive. Precautions should be taken to prevent skin contact or ingestion. 3. Time in a radiation field should be limited to that necessary to perform the required operations. During purge and flush period, it may not be necessary to stand near the panels and consideration should be given to moving to a low dose area. 4. A dose rate instrument should be on and periodic monitoring is suggested during purge and sampling exercises. 5. The LSP operator must verify that the gas chromatograph is ready to receive a gas sample before opening valve RC-V-15. Valve RC-V-15. Walve RC-V-1	TITLE.	SENT	TRY POST-ACCIDENT SAMPLING SYSTEM REACTOR LANT SAMPLING (STRIPPED-GAS AND DILUTED RCS)	•				
 Sample cart/cask A pre-labeled 60 ml sample bottle with a new septum and 14 cc gas sample bottle. MOTE: The labels should have the sample source, date, estimated time of the sample, and the initials of the person taking the sample. (From this point estimate 2C minutes) The gas chromatograph must be in a standby mode with a valid calibration. Assign one LSP operator to EP RB-15:D to prepare the GC. PRECAUTIONS See EP RB-15:A for details. This sampling involves processing of water that will be highly radioactive. Precautions should be taken to prevent skin contact or ingestion. Time in a radiation field should be limited to that necessary to perform the required operations. During purge and flush period, it may not be necessary to stand near the panels and consideration should be given to moving to a low dose area. A dose rate instrument should be on and periodic monitoring is suggested during purge and sampling exercises. The LSP operator must verify that the gas chromatograph is ready to receive a gas sample before opening valve RC-V-15. Valve RC-V-15 must be closed after filling all G.C. sample tops and prior to performing diluted gas sampling and final flushing operations. 			c. Gas bottle griptong					
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 NOTE: The labels should have the sample source, date, estimated time of the sample, and the initials of the person taking the sample. (From this point estimate 20 minutes) 4. The gas chromatograph must be in a standby mode with a valid calibration. Assign one LSP operator to EP RB-15:D to prepare the GC. PRECAUTIONS See EP RB-15:A for details. This sampling involves processing of water that will be highly radioactive. Precautions should be taken to prevent skin contact or ingestion. Time in a radiation field should be limited to that necessary to perform the required operations. During purge and flush period, it may not be necessary to stand near the panels and consideration should be given to moving to a low dose area. The LSP operator must verify that the gas chromatograph is ready to receive a gas sample before opening valve RC-V-15. Valve RC-V-15 must be closed after filling all G.C. sample loops and prior to performing diluted gas sampling and final flushing operations. 			e. A pre-labeled 60 ml sample bottle with a new sep 14 cc gas sample bottle.	tum and				
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 A dose rate instrument should be on and periodic monitoring is suggested during purge and sampling exercises. The LSP operator must verify that the gas chromatograph is ready to receive a gas sample before opening valve RC-V-15. Valve RC-V-15 must be closed after filling all G.C. sample loops and prior to performing diluted gas sampling and final flushing operations. 	3.		Time in a radiation field should be limited to that ne perform the required operations. During purge and fluit may not be necessary to stand near the panels and consideration should be given to moving to a low dose	ecessary to ush period, area.				
5. The LSP operator must verify that the gas chromatograph is ready to receive a gas sample before opening valve RC-V-15. Valve RC-V-15 must be closed after filling all G.C. sample loops and prior to performing diluted gas sampling and final flushing operations.	4.		A dose rate instrument should be on and periodic monit suggested during purge and sampling exercises.	toring is				
	5.		The LSP operator must verify that the gas chromatograp to receive a gas sample before opening valve RC-V-15. RC-V-15 must be closed after filling all G.C. sample is prior to performing diluted gas sampling and final flu- operations.	ph is ready Valve loops and ushing				

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DIABLO	SE CO	NTRY A	DWER PLANT UNIT NO(S) 1 AND 2 POST-ACCIDENT SAMPLING SYSTEM REACTOR SAMPLING (STRIPPED-GAS AND DILUTED RCS)	NUMBER REVISION DATE PAGE	EP RE-15:B 0 7/16/84 3 OF 11
	PRO	CEDURE			
	1.	Veri RC-F	- ify RC-DV-1 is turned to BYPASS. Fill reservoi R-1 with demin water:	r	
		a.	Open RC-V-20 and RC-V-21	1	:]
		b.	Adjust reservoir RC-R-1 until the water level in graduated cylinder RC-C-1 is over 100 mls.	[1
		с.	Close RC-V-21 and RC-V-20	[1
	2.	Veri	fy that the following valves are closed:		
		RC-V RC-V	-1.1 through 1.5 [] -4 []		
	3.	Inse into	rt the needle of the hand operated vacuum pump the septum of the prelabeled 60 ml sample bot	tle: [1
		a.	Evacuate to the maximum vacuum achievable with the hand pump. The vacuum must be at least 1	h <u>5" of Hg</u> . [1
		b.	Keep the pump connected to the bottle for 3 minutes to assure that the bottle retains the	vacuum. []
	4.	Turn stat	on the switch to light the diluted bottle fillion.	ינ	3
	5.	Remo	ve the bottle from the vacuum pump and place le on the cart/cask assembly cavity piston.	[]
		a.	Turn the direction valve for the hydraulic piston to the down position and lower the bottle into the cask cavity.	ſ	1
		b.	Close and open the cask to verify that the cover is working properly.	[]
		c.	Position the cart/cask under the diluted reactor coolant fill station needle and set the brake.	[1
		d.	Turn the direction valve for the hydraulic piston to the up position and raise the bottle onto the needle.	, t	3
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COO	LANT SAMPLING (STRIPPED-GAS AND DILUTED RCS)	
0.	At the PCP verify that the sample cooler water flow, temperature, and pressure annunciator lights are off.	[]
7.	Open the following valves:	
	RC-V-9 [] RC-V-8.2 [] RC-V-10 []	
8.	Drying Expansion Vessel	
	<u>CAUTION</u> : Adhere to directions for clockwise and counterclockwise movement of valves.	
	a. Turn RC-V-11 clockwise to 3 o'clock position.	[]
	b. Pull open RC-VREL-2. When there is a sharp increase in pressure indicated on RC-G-3, release RC-VREL-2.	[]
	c. Adjust RC-VREL-2 until RC-G-3 indicates approximately 20 psig. Dry RC-EV-1 with argon for 1 minute.	[]
	d. Turn RC-V-11 <u>counterclockwise</u> to the 9 o'clock position to permit RC-EV-1 to vent, then close RC-V-9.	[]
9.	Gas Extraction and Line Evacuation	
	 Install the prelabeled, diluted gas sample bottle on the front panel needle. 	[]
	b. Open RC-V-13 and then open RC-V-12 and evacuate until RC-G-2.1 and RC-G-2.2 indicate a minimum of 22" of Hg.	[]
	c. Turn RC-DV-2 to the 6 o'clock position and continue the evacuation until RC-G-2.2 indicates the same reading as RC-G-2.1 or a minimum of 22" of Hg.	[]

DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 R			NUMBER REVISION DATE PAGE	EP RB-15:B 0 7/16/84 5 OF 11
TITLE	SENTRY COOLANT	POST-ACCIDENT SAMPLING SYSTEM REACTOR SAMPLING (STRIPPED-GAS AND DILUTED RCS)		
	d.	Close in order:		
		RC-V-13 [] RC-V-10 [] RC-V-12 []		
		Wait for a minimum 2 minutes to verify vacuum is holding.	ſ]
		Record the vacuum on RC-G-2.1 " of H	Hg. []
	е.	Turn RC-V-11 clockwise to the CLOSED position.	1	3
	f.	Turn RC-DV-2 to the 9 o'clock position.	ſ	3
	g.	Open RC-V-14 and verify the pressure on RC-G-2. is approximately 1 psig.	2 []
1	O. Read	ctor Coolant Sample Line Purge		
	a.	Open RC-V-8.1.	1]
	b.	Open RC-SV-1 and RC-SV-2 by turning breaker #10 to ON.	1	J
	NOTE	The sample source valves are labeled RC-V-1.1 through RC-V-1.5. Throughout this procedure, the form RC-V-1.X will be used to indicate the source valve to be operated. The sample source used for sampling will have been given at a briefing by the Site Chem and Rad Protection Coordinat	or.	
	NOTE	: Upon implementation of the next step, sample will be flowing into the back of the LSP. Th meter-long reach rod should be used to operat valves and a dose rate survey should be done to monitor radiation levels.	e e	
	с.	Close remote flush isolation valve (RFIV).	1	J
	d.	Open the sample source valve RC-V-1.X (see Attachment 1 for proper valve).	t	1

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DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 NUMBER EP RB-15: REVISION 0 DATE 7/16/84 PAGE 6 0F 11				
TITLE S	ENTRY I	POST-ACCIDENT SAMPLING SYSTEM REACTOR SAMPLING (STRIPPED-GAS AND DILUTED RCS)		
	е.	Open RC-V-3.	[]
	f.	Slowly open RC-VREL-1 until RC-FI-1 indicates 100% flow. Purge for 5 minutes.	[]
	g.	Slowly close RC-VREL-1 until RC-FI-1 indicates 36%. Continue the purge for 1 minute.	ſ]
	h.	Close RC-V-3.	[]
11	. Read			
	а.	Open RC-V-2.	I]
	b.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow. Purge for 3 minutes.	ſ	1
	с.	Close RC-V-8.2	ſ]
	d.	Close RC-V-8.1	[]
	e.	Turn RC-DV-1 to SAMPLE.	[]
	f.	Close RC-V-1.X.	[]
	g.	Call the control room and have operations clos the containment isolation valves opened earlie necessary).	e r (if [J
12	12. Initial Flushing			
	а.	At the PCP, perform the following:		
		1) Close the remote source isolation valve.	[]
		2) Close the remote plant isolation valve.	[3
		 Open the remote flush isolation valve (se Attachment 1 for the proper valve). 	e [1
	b.	Open in order valves RC-V-7 and RC-V-4	[]
	c.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow. Flush with demin water for 3 minutes.	ſ	J

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TITLE SENTRY POST-ACCIDENT SAMPLING SYSTEM REACTOR COOLANT SAMPLING (STRIPPED-GAS AND DILUTED RC d. Close RC-V-7 e. Open RC-V-3. f. Adjust RC-VREL-1 until RC-FI-1 indica flow. Flush with demin water for 1 m	<pre>S) [] ates 80-90% minutes. [] [] er for 5 minutes. []</pre>
 d. Close RC-V-7 e. Open RC-V-3. f. Adjust RC-VREL-1 until RC-FI-1 indications. Flush with demin water for 1 models 	[] [] ates 80-90% minutes. [] [] er for 5 minutes. []
 e. Open RC-V-3. f. Adjust RC-VREL-1 until RC-FI-1 indication flow. Flush with demin water for 1 indication. 	[] ates 80-90% minutes. [] [] er for 5 minutes. []
f. Adjust RC-VREL-1 until RC-FI-1 indication flow. Flush with demin water for 1 in Close PC-V-2	ates 80-90% minutes. [] [] er for 5 minutes. []
Close PC-V-2	[] er for 5 minutes. []
y. crose RC-Y-3.	er for 5 minutes. []
h. Open RC-V-1.X. Flush with demin wat	
i. Close RC-V-1.X.	[]
13. Liquid Sample Dilution	
a. Crack open RC-V-21, and add 23 mls of RC-C-1 to the sample bottle, then clo	f water from ose RC-V-21. []
b. Turn the RC-DV-1 to BYPASS.	[]
c. Place the direction valve for the hydrogeneous piston in the down position and lower into the cask.	draulic r the sample []
d. Close the cask.	[]
14. Sample Cask/Cart Removal	
 Release brake and remove the cart/cas sample station and place in temporary 	k from the []
 Perform a radiation and contamination the cart/cask assembly. 	n survey on []
c. Turn off the diluted fill station lig	ht. []
15. Gas Stripping Operation	
 Open RC-V-9, wait approximately 5 sec close RC-V-9. 	conds, and []
b. Open RC-V-16.	[]
c. Snap open RC-V-9 and wait for 1 minut	.e. []

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DIABLO CAN	NUMBER EP RB-15:B REVISION O DATE 7/16/84 PAGE 8 OF 11					
TITLE SE CO	NTRY P	POST-ACCIDENT SAMPLING SYSTEM REACTOR SAMPLING (STRIPPED-GAS AND DILUTED RCS)				
	d.	Close RC-V-16 and then close RC-V-9.	[]			
	e. Turn RC-V-11 <u>counterclockwise</u> to the 9 o'clock position. The pressure reading is normally between 8 and 10 psig. Record the reading on RC-G-2.1					
		G-2.1 psig				
<u>NOTE</u> : The sample is now ready for analysis in the Gas Chromatograph. <u>NOTE</u> : The GC operator should be at step 4.f. of EP RB-15:D.						
						f.
	NOTE	: Do not proceed to the next step until the G operator directs this operation.	.c.			
16.	Dilu	ted Gas Sampling				
	a.	Turn RC-DV-2 to the 6 o'clock position and wa until the pressure on RC-G-2.2 returns to 1 p	it sig. []			
	b.	Turn RC-DV-2 to the 9 o'clock position.	[]			
	c.	Close RC-V-14.	[]			
	d.	Remove the griptong containing the diluted gas sample	[]			

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DIABLO	O CAN	YON P	OWER PLANT UNIT NO(S) 1 AND 2 NUME REVIDATE PAGE	ER SION	EP RB-15:B 0 7/16/84 9 OF 11
TITLE	COC	DLANT	POST-ACCIDENT SAMPLING SYSTEM REACTOR SAMPLING (STRIPPED-GAS AND DILUTED RCS)		
	17.	Fin	al Flushing		
		a.	Verify RC-V-15 is in the CLOSED position.	[1
		b.	Turn RC-V-11 counterclockwise to the 6 o'clock position.	[1
		c.	Open the following valves:		
			RC-V-9 RC-V-7 RC-V-8.1		
		d.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow. Flush with demin water for 1 minute.	Ę]
		e.	Open RC-V-8.2.	[]
		f.	Close RC-V-9 and RC-V-7.	[]
		g.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow. Flush with demin water for 3 minutes.	[]
		h.	Close RC-7-8.1.	[]
		1.	Turn RC-V-11 counterclockwise to the 3 o'clock position.	ſ	1
		j.	Open RC-1-9.	1]
		k.	Pull open RC-VREL-2.	[]
			 When there is a sharp increase in pressure indicated on RC-G-3, release RC-VREL-2. 	ſ]
			2) Adjust RC-VREL-2 until RC-G-3 indicates 20 psig	. [1
			3) Flush with argon for 3 minutes.	[3
		1.	Close RC-V-9.	ſ	3
		m.	Open RC-V-10.	1	1
		n.	Turn RC-V-11 counterclockwise to the 9 o'clock position and allow RC-EV-1 to vent.	ſ	1

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DIAPLO CAN	YON POWER PLANT UNIT NO(S) 1 AND 2 R	UMBER EVISION ATE AGE	EP RB-15:B 0 7/16/84 10 OF 11	
TITLE SE CO	NTRY POST-ACCIDENT SAMPLING SYSTEM REAC(OR DLANT SAMPLING (STRIPPED-GAS AND DILUTED RCS)			
	o. Close RC-V-10.	I]	-
	p. Turn RC-V-11 clockwise to CLOSED.	[]	
	q. Open RC-V-8.1.	[]	
	r. Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow.	[]	
	Flush with demin water for 1 minute.	[]	
	s. Close RC-V-2.	[]	
	t. Open RC-V-1.X and flush with demin water for 5 minutes.	ľ]	
	u. Close RC-V-1.X.	[]	
	<pre>v. Terminate flushing by closing the following value RC-V-8.1 RC-V-8.2 RC-VREL-1 RC-VREL-2 RC-V-4 [] </pre>	es. [1	
18.	At the PCP, close the remote flush isolation valve.	[]	
19.	At breaker panel PYNMII, place breaker #10 to the OFF position.	Į	3	
20.	Close sample cooler water.	[]	
21.	Call the Site Chem and Rad Protection Coordinator and inform him that the diluted reactor coolant sample and the off-gas sample are ready for transfer/analysis.	ſ]	
22.	Sample transfer.	[]	
	a. Transfer the diluted off-gas sample to the TSC.	[]	fin he	
	b. Using procedure EP RB-15:E, aliquot and analyze the diluted liquid sample for boron.	ſ	ן	
23.	Process the data according to procedure EP RB-15:F.	[]		

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	PAUL	11 OF 11
TITLE SENTRY POST-ACCIDENT SAMPLING SYSTEM REACTOR COOLANT SAMPLING (STRIPPED-GAS AND DILUTED RCS)		

REFERENCES

.* 1.

 Sentry Equipment Corp. High Radiation Sampling System Operating and Maintenance Manual.

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ATTACHMENTS

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1. Valves for Obtaining Samples from Reactor Coolant.

PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

TITLE: VALVES FOR OBTAINING SAMPLES FROM REACTOR COOLANT

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ATTACHMENT 1

SAMPLE SOURCE	REMOTE PLANT ISOLATION VALVE (RPIV)	REMOTE SOURCE ISOLATION VALVE (RSIV)	REMOVE FLUSH ISOLATION VALVE (RFIV)	SOURCE VALVE (SSV)
RC Hot Leg 1	FCV-9351 A	FCV-692	FCV-1416	RC-V-1.1
RC Hot Leg 4	FCV-9351 B	FCV-692	FCV-1416	RC-V-1.1
PZR Liquid	FCV-9350 B	FCV-693	FCV-1417	RC-V-1.2
PZR Steam	FCV-9350 A	FCV-694	FCV-1418	RC-V-1.3
RHR Pump 1-1 Discharge	FCV-9353 A	FCV-1413	FCV-1419	RC-V-1.4
RHR Pump 1-2 Discharge	FCV-9353 A	FCV-1413	FCV-1419	RC-V-1.4
VCT Liquid	N/A	FCV-1412	FCV-1420	RC-V-1.5

PG	Pacific Gas and Electric Company	NUMBER REVISION	EP RB-15:C O
n	DEPARTMENT OF NUCLEAR PLANT OPERATIONS	DATE	7/16/84
	DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 EMERGENCY PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM TITLE: CONTAINMENT AIR SAMPLING	PAGE	1 OF 8
	APPROVED R. C. Thomas PLANT MANAGER	1-27-84 DATE	

DISCUSSION

IMPORTANT TO ENVIRONMENTAL QUALITY

The purpose of this procedure is to detail the steps required to make containment air available for gas chromatography and to dilute a containment air sample for isotopic analysis of noble gases, particulates, and radionuclides. This procedure will also detail the steps for a complete system flush and return to the initial valve line up.

After purging containment air through the G.C. and loading the diluter valve, this procedure will direct sampling personnel to EP RB-15:D, for gas analysis and to procedure EP RB-15:E, for preparation of the diluted containment air sample for isotopic analysis.

The containment isolation valves FCV-698, FCV-699 and FCV-700 are controlled from the Containment Isolation Valve Panel in the Sentry Room only. These switches require redundant keys to operate. Copies of the keys are located in the Control Room, Radiation Protection Office, and in the Sentry Room in a key box with a breakable glass cover. These valves should be opened only during an emergency or for testing.

PREREQUISITES

- System was initially lined up as described in procedure EP RB-15:A.
- 2. Verify that the following annunciator windows are off on the PCP
 - a. LIQUID SAMPLE PANEL HIGH PLENUM PRESS
 - b. CHEMICAL ANALYSIS PANEL HIGH PLENUM PRESS
 - C. CONTAINMENT AIR SAMPLE PANEL HIGH PLENUM PRESS

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DIABLO CAN	YON POWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-15:C REVISION O DATE 7/16/84 PAGE 2 OF 8
TLE SEI	NTRY POST-ACCIDENT SAMPLING SYSTEM NTAINMENT AIR SAMPLING	
3.	The following equipment must be available and operat	ional:
	a. Meter-long reach rod	
	b. A gas tight 5cc locking syringe	
	c. A 14cc gas vial with a new septum installed	
	d. Bags, tape, and labels	
	e. Four channel MBIS Pressure Monitor (CASP-PI-110	9)
	f. Two crescent wrenches	
	g. Spare filter assemblies	
PRE	CAUTIONS	
1.	This sampling involves processing of containment air highly radioactive. Precautions should be taken to releases to the sampling environment.	that may be prevent
2.	Time in a radiation field should be limited to that perform the required operations. During purge and f it may not be necessary to stand near the panels and consideration should be given to moving to a low dos	necessary to lush periods, e rate area.
3.	A dose rate instrument should be on and periodic mon suggested during purge and sampling exercises.	itoring is
PRO	CEDURE	
1.	Sample Flask Evacuation	
	NOTE: Ensure that a loaded filter assembly is insta	lled.
	a. Close outlet valve of the engaged cart/cask.	[]
	b. Verify that any unused CASP ports located at the base of the CASP have been capped.	[]
	c. At the CCP, place the switch for CCP-AV-1 to OP	EN. []
	NOTE: This allows containment pressure to be monitored on CASP-PI-1109.	

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DIABLO	CANYON	N POV	VER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE PAGE	EP RB-15:C 0 7/16/84 3 OF 8
TITLE	SENTR	AT PC	OST-ACCIDENT SAMPLING SYSTEM		
	d	1.	Change the positions of the following valves	:	
			CASP-DV-1 to Containment Supply	1	1
			CASP-V-16 to CASP-SF-5	(]
	e		Contact the Control Room and request permissi FCV-700, the sample return containment isolat succeeding steps FCV-698 and 699 and will be Inquire whether the Control Room wants to be time each valve is operated or only when samp completed and containment isolation valves ar obtain and record containment temperature and the Control Room.	on to open ion valve. operated al notified ev ling is e closed. pressure f	ln Iso. Very Also from
			(°F + 460) x 5/9 =°K = T	Γc	
			psig.		
	f	f.	Evacuate CASP-SF-5 by opening the following v	alves:	
			FCV-700 (key operated)		[]
			CASP-V-17		[]
			CCP-AV-2		[]
			CCP-SV-10		[]
	g	g.	When CASP-SF-5 pressure is as low as apparent achievable as indicated on CASP-PI-1116, alig CASP-V-16 to CASP-DV-1. If vacuum is not hel replace the filter assembly or septum and rep steps c. through f.	tly gn Id, peat	[]
	2. 5	Samp	le Purge		
	ä	a.	Open containment isolation valves FCV-699 and FCV-698 at the Containment Isolation Valve Panel and notify the Control Room, if request	d ted.	[]

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TITLE	SENTRY F		EP RB-15:C O 7/16/84 4 OF 8	
	CONTAINM	POST-ACCIDENT SAMPLING SYSTEM MENT AIR SAMPLING		
	b.	Containment air is now being purged through the sample panel back to containment. Purge for 5 minutes.	[]	
	c.	At the CCP, close CCP-SV-10 and record containment air pressure as indicated on CASP-PI-1109.		
		CASP-PI-1109 P	sig	
	d.	Sample Purge through the G.C.		
		 At the LSP, align RC-V-15 to CASP TO GAS CHROMAT position. 	[]	
		2) At the G.C. control panel do the following:		
		(a) Depress MAN	[]	
		(b) Press CLEAR	[]	
		(c) Depress SAMP switch and verify red sample light is on.	[]	
		(d) Select loop No. 1	[]	
		(e) Enter "23" to purge sample from CASP to the G.C. purge for 2 minutes.	[]	
		(f) Enter "24" to terminate the purge.	[]	
		(g) Release SAMP switch to OFF position.	[]	
		3) At the LSP, align RC-V-15 to CLOSED.	[]	
		NOTE: The sample is now ready for analysis with the G.C.		
	e.	Record the temperature indicated on THT 196.		
		°C + 273 =°K = Ts		
	f.	Record Sample Time		

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DIABLO	CANY	YON PO	WER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE PAGE	EP RB-15:C 0 7/16/84 5 OF 8
TITLE	SEN	TAINM	OST-ACCIDENT SAMPLING SYSTEM ENT AIR SAMPLING		
	3.	Samp	le Dilution		
		a.	Align CASP-DV-1 to CASP-SF-5. N will flush the sample aliquot into CASP-SF-5 through the removable filter assembly.	[]
		b.	When the pressure in CASP-SF-5 as indicated or CASP-PI-1116 is 14.70 psia, or as high as achievable, whichever is first, close CASP-V-3	n 17. [1
		NOTE	The G.C. operator should be at Section 4.f. EP RB-15:D. When directed by the G.C. opera align RC-V-15 to the CASP TO GAS CHROMAT. po	of ator, osition.	
		NOTE	: Do not proceed with the next step until the operator directs this operation.	G.C.	
	4.	Init	ial Flushing		
		a.	If the G.C. was used for containment H_2 analysperform the following steps, otherwise ² skip to	sis then step b.	
			 At the LSP, align RC-V-15 to CASP TO GAS position. 	CHROMAT []
			2) At the G.C. control panel, enter "13" to argon flush of sample line back to CASP	start	
			for 2 minutes.	[]
			 Terminate argon flush by entering "14" at G.C. control panel. 	the []
			4) At the LSP, align RC-V-15 to CLOSED posit	ion. []
		b.	Align CASP-V-16 to CASP-SF-5	[]
		c.	Open CCP-SV-10 and flush removable filter assembly for 1 minute.	ſ	1
		d.	Close containment isolation valve FCV-699.	[]
		e.	Open CCP SV-5.	[J
					1

DIABLO	CAN	YON PO	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE PAGE	EP RB-15:C 0 7/16/84 6 OF 8
TITLE	SEN	NTRY F	POST-ACCIDENT SAMPLING SYSTEM MENT AIR SAMPLING		
		f.	Change the positions of the following valves:		
			Align CASP-DV-1 to Containment Supply	[]
			Align CASP-V-16 to CASP-DV-1	[]
		g.	At the CCP, close CCP-AV-2 and CCP-SV-5.	[]
		h.	Open containment isolation valve FCV-699 and flush line with nitrogen for 2 minutes. Notif the Control Room that this valve was opened, if requested to earlier.	y r	1
		i	Close CCP-SV-10 and CCP-AV-1	r	1
	5	Samn	le Handling	·	,
		Jamp	Survey the removable filter accombly and CASP-	55-5	
		a.	to determine contact dose rates.	[]
			NOTE: Under worst case conditions, the contact dose rate of the filter, using a telete will be about 165 mR/hr. The contact do rate at centerline of CASP-SF-5 will be 44 mR/hr.	t ctor, lose about	
		b.	Position the exhaust duct as close as possible to the removable filter assembly.	ſ]
		c.	Using the crescent wrenches, disconnect the fi assembly from the system, then separate the as into two halves and place the two halves in a seal, and survey.	lter sembly bag,]
			 Place a prewritten label on the bag. The label should have the name of the sample, rate, time containment air pressure, and initials of the sampler. 	dose the]
			2) Store the sample to minimize exposure fro	m it. []
		d.	Install a new filter assembly into the system making sure the connections are tight.	ſ]
		e.	Partially evacuate a septum sealed 14cc gas vi by withdrawing 2cc from it using a syringe.	al [1
					Second Reserved and

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DIABLO CANYON P	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE PAGE	EP RB-15:C 0 7/16/84 7 OF 8
TITLE SENTRY CONTAIN	POST-ACCIDENT SAMPLING SYSTEM MENT AIR SAMPLING		
f.	Flush a 5 ml gas tight syringe by inserting needle into the septum of CASP-SF-5, withdraw lcc and injecting it again.	its wing []
g.	Using the flushed syringe withdraw a 2cc samp aliquot from CASP-SF-5.	ple [1
h.	Inject the syringe contents into the evacuate 14cc gas vial.	ed []
i.	Place the gas vial into a bag, seal and surve	ey it. []
j.	Place a prewritten label on the bag. The lab shall have the name of the sample, dose rate, time, cont. air pressure, volume of 1 ml and initials of the sampler	the r	
L	Storp the sample to minimize another in	L	1
6 Fin	Store the sample to minimize exposure from it	ι. [1
0. F1N	al Flushing		
а.	Align CASP-V-16 to CASP-SF-5.	[]
b.	Open the following valves:		
	CCP-AV-2 []		
	CCP-SV-10 []		149-146
	CASP-V-17 []		
с.	Evacuate CASP-SF-5 until vacuum is as low as achievable as indicated on CASP-PI-1116	ſ]
d.	Close CCP-AV-2 and allow N_2 to fill CASP-SF-5	i. []
e.	Repeat steps 18.b. through d. above once more	. E	1
f.	Close CCP-SV-10.	[]
g.	Open the OUTLET valve on the engaged cart/cas	.k. []

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rLE 7	h. i.	Open CCP-SV-10. Open CCP-SV-12 and allow N ₂ to flush the line for 2 minutes. minate flushing by closing the following valves: CCP-SV-10 [] CCP-SV-1.2 []	[] []
7	h. i.	Open CCP-SV-10. Open CCP-SV-1.2 and allow N ₂ to flush the line for 2 minutes. minate flushing by closing the following valves: CCP-SV-10 [] CCP-SV-1.2 []	[] ; ;
7	i. . Terr	Open CCP-SV-1.2 and allow N ₂ to flush the line for 2 minutes. minate flushing by closing the following valves: CCP-SV-10 [] CCP-SV-1.2 []	[]
7	. Terr	ninate flushing by closing the following valves: CCP-SV-10 [] CCP-SV-1.2 []	
		CCP-SV-10 [] CCP-SV-1.2 []	
		CCP-SV-1.2 []	
		CCP-AV-1 []	
8	. Cha	nge the positions of the following valves:	
		CASP-V-16 to CASP-DV-1 []	
		CASP-DV-1 to CASP-SF-5 []	
9). Tur Pre	n OFF and disconnect the CASP-PI-1109, MBIS ssure Monitor connected to the cart/cask.	[]
1	0. At fol the	the Containment Isolation Valve Panel CLOSE the lowing valves and notify the Control Room that y are closed:	
		FCV-598 []	
		FCV-699 []	
		FCV-700 []	
1	11. At and OFF	the CMP, turn the power switch to OFF if it was at the CCP turn the FUNCTION SELECT switch to and deenergize the heat tracing.	ON []
1	12. Pro	cess the data according to procedure EP RB-15:F	. []
R	REFERENC	ES	
1	L. NUR	EG 0/37	
2	2. Dia	blo Canyon Shielding Review.	

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	PARTMENT OF NUCLEAR PLANT OPERATIONS ABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE PAGE	EP RB-15:D O 7/17/84 1 OF 6
	TLE EMERGENCY OPERATING PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM GAS CHROMATOGRAPHIC HYDROGEN ANALYSIS PPROVED <u>R.C. Thombur</u> PLANT MANAGER	7-27-84 DATE	
DISCU	IMF ENVIRON	ORTANT T	OUALITY
The f deter the f chroi RC-V anal proc	purpose of this procedure is to detail the steps rmine the dissolved hydrogen concentration in rea percent hydrogen concentration in containment air matography. This procedure will detail hydrogen -15 on the LSP to the Gas Chromatograph. The sar ysis should be prepared according to any of the edures:	required to actor coolant r by gas analysis fro mple gas for following	and m
	EP RB-15:B EP RB-15:C		
PRER	EQUISITES		
1.	The Gas Chromatograph (G.C.) should be in the O condition for a minimum of 30 minutes before sa	N or STANDBY mple analysi	s.
2.	The gas sample for analysis should be available transfer to the G.C.	e at the LSP	for
3.	Carrier gas (Ar) should be available with cylir pressure 1000 psig.	nder outlet	
PRE	CAUTIONS		
1.	Monitoring with a dose rate instrument should I transfer of sample to the G.C.	be done durir	ng the
	If the carrier gas cylinder empties while the thermal conductivity detector (TCD) protection off the current to the TCD.	G.C. is in us device will	se, the turn

DIABLO	CANY	ON PO	WER PLANT UNIT NO(S) 1 AND 2 NUMBER REVISION DATE	EP RB-15:D 0 7/17/84						
TITLE	SEN	ENTRY POST-ACCIDENT SAMPLING SYSTEMS - GAS CHROMATOGRAPHIC HYDROGEN ANALYSIS								
	PROC	EDURE								
	1.	Anal	ysis Program							
		a.	Release all pushbuttons and depress the CLEAR button.	[]						
		b.	Check that the following program is in memory by entering the two digit STEP number and verify that the 'TIME and numbers are as shown below. Do this for each STEP. If memory is correct, proceed to Step 2, Platen Stabilization.	CODE the						
			STEP TIME CODE							
			01 00:01 03 02 00:02 25 03 00:30 01 04 01:15 00							
		с.	If the program is not correct, enter the program as foll	ows:						
			1) Depress ENTER and CLEAR	[]						
			 Enter the above program into memory by entering the digit pairs in the sequence shown above. 	two []						
			NOTE: If an entry error is made, depress CLEAR to blank display and re-enter the entire line.							
			3) Release ENTER, depress CLEAR and repeat step 1.b.	[]						
	2.	Plat	en Stabilization							
		a.	Depress MAN and CLEAR	[]						
		b. Check to see if the G.C. has stabilized by doing the following:								
			1) Select attenuation factor of 250 (25 x 10)	[]						
	 Enter "01" and then "35" to display set point of pl temp and record for a minimum of 30 seconds. 									

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DIABLO CANY	DN POWER PLANT UNIT NO(S) 1 AND 2 REVIS	ION 0 7/17/84 3 OF 6
SEN	RY POST-ACCIDENT SAMPLING SYSTEMS GAS CHROMATOGRAPHIC HYDROGEN ANALYSIS	
	 Enter "45" to display actual platen temperature record for a minimum of 30 seconds. 	and []
	NOTE: Stabilization is complete when platen set-poi actual temperature are within 1/2 grid markin each other as indicated on the G.C. chart rec only.	nt and g of order
	 Enter "00" and mark chart recorder on the G.C. date, time, and initials. 	with []
3.	Calibration Verification	
	NOTE: If analysis is required on a second sample source, the G.C. calibration verification is not needed ag Proceed to Step 4, Sample Analysis.	, then jain.
	NOTE: Only 1 span gas is needed to verify calibration. following steps describe the use of either gas. I this step only if directed by supervision.	The Perform
	a. Enter "23" to evacuate the G.C. Continue evacuation the red HI VACUUM light is on.	n until []
	b. Enter "24" to terminate evacuation of the G.C.	[]
	c. Select attenuation factor of 500 (5 x 100) for the source or 5 (5 x 1) for the 2000 ppm $\rm H_2$ source.	10% ^H f J
	d. Depress CAL-1 switch for 10% H ₂ source, or CAL-2 sw 2000 ppm H ₂ source, and wait 10 seconds after amber VACUUM light is on.	LOW
	e. Release CAL-1 or CAL-2 switch and wait 10 seconds.	[]
	f. Start the L&N recorder.	[]
	g. Depress AUTO switch to on (in) and press CLEAR. We the G.C. display clock has timed to a minimum of 3 minutes. During this time interval, identify the I recorder trace with the date/time, gas used, loop in attenuation factor and operator initials.	ait until L&N number, []

DIABLO C	ANYON PO SENTRY PI GAS CI	WER PLANT UNIT NO(S) 1 AND 2 DST-ACCIDENT SAMPLING SYSTEMS HROMATOGRAPHIC HYDROGEN ANALYSIS	NUMBER EP RB-15:D REVISION O DATE 7/17/84 PAGE 4 OF 6
	h.	Release AUTO switch to off (out) position. P enter "00".	ress CLEAR and
	i.	Stop the L&N recorder.	[]
	j.	Calculate the hydrogen peak height as follows	:
	peak	height = (Trace peak height - baseline) x att	enuation
		peak height =	
	k.	Compare the peak height calculated against the on the concentration versus peak height curve attenuation factor and calibration gas. The be within \pm 10 percent of each other.	e value shown for the same values should []
4	. Samp	le Analysis	
	a.	Depress SAMP switch and verify red sample lig	ht is on. []
	b.	Select loop No. 1.	[]
	c.	Enter "23" to evacuate the G.C. until the red light is on.	HI VACUUM []
		 Cycle loop selector through loops 2, 3, at each loop and evacuating until the HI is on. 	and 4, pausing VACUUM light []
		 Cycle a minimum of 3 times through loops and 4, pausing at each loop. 	1, 2, 3, []
		3) Select loop number 1.	[]
	d.	Enter "24" to terminate evacuation.	[]
	е.	Select attenuation factor of 500 (5 x 100).	[]
		NOTE: Before proceeding consult with the LSP assure that a gas sample is available a	operator to at RC-V-15.
	f.	When the appropriate gas sample is available a lign RC-V-15 to one of the following position	at RC-V-15 ns:
DI	CO109 41	,	

NUMBER EP RB-15: REVISION 0 DATE 7/17/84 PAGE 5 OF 6							
SENTRY POS	ST-ACCIDENT SAMPLING SYSTEMS ROMATOGRAPHIC HYDROGEN ANALYSIS						
	 LSP TO GAS CHROMAT. for reactor coolant of sample. 	off-gas	[]				
	2) CASP TO GAS CHROMAT. for containment air	sample.	[]				
g.	Cycle loop selector through loops 1, 2, 3, an each loop. Cycle 3 times.	d 4, pausir	ng at []				
	1) Select loop 1		[]				
h.	Align RC-V-15 to the CLOSED position.		[]				
	NOTE: If the analysis applies to containment to step "j".	t air, proc	eed				
1.	Record the pressure on RC-G-2.1 on the data and EP RB-15:F. Reading: psig	sheet,					
	NOTE: The pressure is normally between 5 an	d 7 psig.	used				
	NOTE: Notify the main LSP operator when RC-	-15 15 CI	r 7				
j.	Start the L&N recorder, wait 5 seconds.		r 3				
k.	Depress AUTO to on (in) position and press (LEAR.	L J				
	 Wait until the G.C. display clock has minimum of 3 minutes. During this time identify the recorder trace with sample date/time, loop number, attenuation fac initials. 	timed to a e interval e name, ctor and op	erator []				
1.	Release AUTO switch to off (out) position. enter "00".	Press CLEA	AR and []				
m.	Stop the L&N recorder.		[]				
n.	Calculate the net peak height and determine concentration from the appropriate calibrat	the hydro	gen []				
	peak height =	·	mm				
0.	Record the net peak height on the recorder the analysis and select the next loop and a attenuation factor (5 x 1, 25 x 1, 1 x 100 required. Repeat steps j. through o. as no satisfactory data.	trace. Re appropriate , or 5 x 10 ecessary to	peat)0) as obtain []				
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SENTRY	OWER PLANT UNIT NO(S) 1 AND 2 POST-ACCIDENT SAMPLING SYSTEMS CHROMATOGRAPHIC HYDROGEN ANALYSIS	EP RB-15:D 0 7/17/84 6 OF 6
p.	Purge the G.C. residual gas as follows:	
	 Enter "23" and evacuate the G.C. until the red HI VACUUM light is on. 	[]
	 Cycle through each loop and evacuate until the red VACUUM light is or. 	HI []
	3) Enter "13" to initiate argon purge.	[]
	 Cycle loop selector through loops 1, 2, 3, and 4, pausing at each loop. Cycle 3 times. 	[]
	5) Enter "14" to terminate the purge.	[]
	6) Enter "24" to terminate the evacuation.	[]
	7) Enter "00".	[]
	8) Release SAMP switch to off position.	[]
q.	After final use of G.C.	
	1) Shutdown the instrument by turning off the power.	[]
	2) Secure the gas supplies for the GC.	
	a) CLOSE the 3 root valves next to the CAP.	[]
	b) CLOSE CAP-V-10	[]
	c) CLOSE CAP-V-14	[]
r.	Return to the referencing procedure.	
	NOTE: For stripped-gas, this is EP RB-15:B, step 17. Containment Air, this is EP RB-15:C, step 4.	For
5.	Record the net peak height from step n. on the appropridata sheet.	ate
REFEREN	ES	
1. Sei an	try Equipment Corp. High Radiation Sampling System Operat Maintenance Manual.	ing

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PG) = I	Pacific Gas and Electric Company	NUMBER REVISION	EP RB-15:E O
0	DEPARTN	ENT OF NUCLEAR PLANT OPERATIONS	DATE PAGE	7/17/84 1 OF 15
U	TITLE	EMERGENCY PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM RCS LIQUID AND GAS SAMPLE HANDLING		
	APPROVE	D <u>C. C. Thombur</u> PLANT MANAGER	7-27-84 DATE	

SCOPE

IMPORTANT TO ENVIRONMENTAL QUALITY

This procedure provides guidance for safely handling post accident liquid samples obtained from the Reactor Coolant System (RCS) using the SENTRY PASS. The <u>diluted</u> liquid sample from the RCS is aliquotted. The aliquot may be used for boron or for γ -assay. Further dilutions for γ -assay are done in the hot cell. Likewise, steps for preparation of diluted containment air samples for counting are also detailed. This procedure and changes thereto require PSRC review.

DISCUSSION

Based on worst-case post accident assumptions regarding sample radioactivity content, special precautions may be required for handling RCS and containment air sample acquired using the Sentry PASS. Sample aliquots are transferred by precision pipets to a dilution vial for radiological counting or an appropriate reaction flask for chemical analysis. These flasks may be kept inside the hot cell throughout the procedure to minimize personnel exposures and also to contain the airborne radioactivity generated within the hot cell area. Control of airborne activity is accomplished by use of an overhead ventilation duct which creates a slightly negative pressure inside the enclosure. After all sample manipulations are completed, the radioactive waste solutions may be flushed down the Sentry Room sink via the receiver funnel drain valve and, if necessary, the inside surfaces of the hot cell may be sprayed down to reduce the contamination levels within the sample handling area.

PREREQUISITES AND PRECAUTIONS

 Personnel assigned to conduct this procedure should be familiar with the considerations of handling high'y radioactive liquid and gas samples and shall be experienced with the analytical chemistry techniques employed in this procedure. Also, any individual performing this procedure should be capable of:

 SENTRY POST-ACCIDENT SAMPLING SYSTEM RCS LIQUID AND GAS SAMPLE HANDLING a. Making does rate measurements with portable survey instruments. b. Assessing response and basic trends of continuous air monitoring equipment. c. Taking actions based on items 1.a and 1.b. 2. Unless conditions are known to warrant less stringent precautions, complete protective clothing and accident dosimetry (including high range and extremity dosimeters) will be required. Lapel air samplers are also recommended. Full respiratory protection equipment (SCBA) may also be necessary. 3. To minimize time spent in hot sample handling, ensure availability of the required equipment for performing applicable portions of this procedure. This includes sample vessels, pipets, handling tools, reagents, etc. A comprehensive listing of these supplies is provided in a check list format in Appendix to this procedure to facilitate the review. 4. When the liquid sample is handled, there is a possibility that local radiation levels and airborne radioactivity could increase. Since the sample is to be contained within the hot cell, the increases should not be too high, however, as precautionary measure, all individuals within the Sentry Room should have (for airborne) for early identification of potential problems. 5. This procedure is designed to permit all sample handling to be performed by the use of tongs or other remote handling devices. Unless the samples are surveyed and known not to present a significant source of exposure to the fingers, hands or other extremities, no sample manipulations involving direct hand contact should be attempted.	 SENTRY POST-ACCIDENT SAMPLING SYSTEM RCS LIQUID AND GAS SAMPLE HANDLING Asking does rate measurements with portable survey instruments. Assessing response and basic trends of continuous air monitoring equipment. Taking actions based on items 1.a and 1.b. Unless conditions are known to warrant less stringent precautions, complete protective clothing and accident dosimetry (including high range and extremity dosimeters) will be required. appl air samplers are also recommended. Full respiratory protection equipment (SCBA) may also be necessary. To minimize time spent in hot sample handling, ensure availability of the required equipment for performing applicable protes us to facilitate the review. When the liquid sample is handled, there is a possibility that local radiation levels and airborne radioactivity could increase. Since the sample is to be containing should have (for airborne) for early identification of potential problems. This procedure is designed to permit all sample handling to be survey instruments (for dose rates) and any available CAM system (for airborne) for early identification of potential problems. This procedure is designed to permit all sample handling to be extremities, no sample manipulations involving <u>direct</u> hand contact should be attempted. 	DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 NUMBER EP RB-15 REVISION 0 DATE 7/17/84 PAGE 2 OF 1									
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This section covers the preliminary steps required before performing actual liquid sample manipulations. It is important	This section covers the preliminary steps required before performing actual liquid sample manipulations. It is important		1.	Prep	aration of Sample Enclosure and Sink Area						
				This perf	section covers the preliminary steps requir orming actual liquid sample manipulations.	ed before It is importa	nt				

SENTRY P	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-15:E REVISION O DATE 7/17/84 PAGE 3 OF 15
AND GAS	SAMPLE HANDLING	
tha are min cel	t all required handling equipment and reagents available prior to handling the liquid sample mize time spent working around hot samples with	to be employed in order to thin the hot
a.	Initial Survey of Sample Enclosure and Sink /	Area
	 Perform a radiation survey of the hot cerverify that no highly radioactive sample remains inside or around the enclosure tuse. If an indication of radioactive satis found, these materials should be promof as set forth below under "Clean-Up" this procedure. 	ell area to e material from a previous ample materials mptly disposed in Section 6 of
	 Visually inspect the inside of the hot of unwanted material and for cleanliness. remains, remove and store or discard it, appropriate. 	cell for If material whichever is
b.	Acquisition of Required Supplies	
	Assemble the necessary supplies, equipment, e the required steps. A listing of these suppl presented in Appendix 1 to this procedure for preparation and analysis categories.	etc. to perform lies is the following
	1) General Equipment Requirements (Sections	1, 2, and 6)
	 Dilution of Liquid Sample for Radiologic (Section 3) 	al Counting
	3) Chemical Analysis for Boron Levels (Sect	ion 4)
	4) Dilution of Off-gas for Isotopic Analysi	s (Section 5)
	5) Containment Air Fractionation Supplies	
с.	Preparation of Hot Cell Area for Use	
	1) Open the access door to the hot cell	

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SENTRY PO	A PLANT UNIT NO(S) 1 AND 2 RE DA PA ACCIDENT SAMPLING SYSTEM RCS LIQUID LE HANDLING	MBER EP RB-15:E VISION O TE 7/17/84 GE 4 OF 15
	close the receiver funnel drain valve.	
	Fill the receiver funnel with demin water.	
	Open receiver funnel drain valve and verify drains in an unrestricted manner.	liquid
	<u>NOTE</u> : If flow is obstructed, it may be nece blow out the drain line. This line m freely prior to using the hot cell for A squeeze bulb or Oxford pipet with p may be used to force flow.	ssary to ust drain r analyses. lastic tip
	Carefully position shielded sample holder br in conjunction with pipet operations.	ick for use
	If a liquid sample for radiological analysis diluted pursuant to Section 3 of this procedu install an uncapped, clean 20 cc liquid scin- vial into its appropriate sample port within holder brick. Leave the cap and sealing tape the hot cell for later use.	is to be ure, tillation the sample e outside
	If a Boron analysis is to be performed (pursu Section 4), install two 50 ml Erlenmeyer flas their appropriate sample ports within the sam brick. Leave rubber stopper caps (one for ea flask) outside the hot cell for later use.	uant to sks into nple holder ach 50 ml
	If a Boron analysis is to be performed, insta clean, uncapped, prewiped 1 cm path length ph into the appropriate sample port within the s holder brick. Keep the cap plug available ou hot cell for later use.	all a notocell sample utside the
	E: Be careful not to scratch the transmission nor to deposit extraneous material (e.g lint) especially from gloves.	surfaces powder or
	Check that a RO-7-BM probe, or appropriate rais installed in the mount above the receiving	inge probe, funnel.

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DIABLO	CAN	YON PO	WER P	LANT UNIT NO(S) 1 AND 2	NUMBER EP RB-15:E REVISION O DATE 7/17/84
TITLE	SENT	TRY PO GAS S	ST-AC AMPLE	CIDENT SAMPLING SYSTEM RCS LIQUID HANDLING	FAGE 5 UF 15
				cell. The attached cable should run chimney and fit in the slot provided the cable to the RO-7 and turn the de	through the vent for it. Connect etector on.
			10)	Place the power cord for the magnetic along the same path as the cable ment	stirrer, if used, tioned above.
			11)	Verify air flow (a piece of paper is the elephant trunk vent shroud.	s suggested) into
			12)	Connect ventilation shroud to the chi cover switch.	imney on top of
			13)	Prepare remaining equipment, material required for the planned sample manip analyses.	ls, reagents, etc. bulations and
	2.	Obta	ining	a Liquid Sample from the cart/cask	
		a.	Move	the cart/cask to the sink area and se	et the brake.
		b.	Unco from	ver the sample vial by rolling the rac the sample cavity.	diation shield away
		c.	Place the sead	e an RO-2A over the funnel in the hot ambient background response of the RO- ing and then remove the RO-2A.	cell and determine -2A. Note the
			R0-2	A Reading:mR/hr (ambie	ent background)
			1)	Transfer the bottle containing the di coolant to the hot cell and remove th	iluted reactor ne lid.
			2)	Close the cask and move it away.	
			3)	Close the access door to the hot cell	u di shiningi k
		e.	Measuread	ure the radiation level with the RO-7 ing.	and record the
				mR/hr (ambient backgro	ound plus sample)

DIABLO	CANY	ON PO	WER PLANT U	NIT NO(S) 1 AND 2	NUMBER EP RB-15:E REVISION O DATE 7/17/84					
TITLE AND GAS SAMPLE HANDLING SYSTEM RCS LIQUID										
	f. Calculate the net sample reading by subtacting the value of step 2.c. from the value of step 2.e.									
				mR/hr (step 2.e.	.)					
				mR/hr (step 2.c.	.)					
				mR/hr (net samp)	e reading)					
	3.	Dilu	tion and Pr	eparation of Liquid Sample for Radi	oassay					
		This obta samp	step invol in a counti le volume i	ves selection and dilution of a sam ng geometry of 10 mls liquid in a 2 s based on the exposure rate record	ple aliquot to 20 ml vial. The 1ed in Step 2.f.					
		a.	Select the follows:	appropriate pipet tip size and pip	et volume as					
			Pipet	Approx. Step 2.g. Reading	Check					
			5 m1 1 m1 100 µ1 10 µ1	< 1.6 mR/hr > 1.6 mR/hr but < 16 mR/hr > 16 mR/hr but < 160 mR/hr > 160 mR/hr						
		b.	Open the a	ccess door on top of shielded sampl	e enclosure.					
	c. Using the pipet volume setting chosen in Step 3.a. above, obtain this volume of RCS liquid sample from the receiver funnel, keeping hands as far away as possible from the "hot" sample liquid.									

DIABL	O CAN	YON PO	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE	EP RB-15:E 0 7/17/84
TITLE	SEN' AND	TRY PO GAS S	ST-ACCIDENT SAMPLING SYSTEM RCS LIQUID	PAGE	7 OF 15
		d.	Slowly discharge the aliquot into the empty 2 scintillation vial previously placed within t brick. Discard the pipet tip.	20 cc liquid the shield	
			NOTE: Dispose of materials that have contact contaminated mediums separately from t not.	ed highly hose that h	ave
		e.	Using the appropriate pipette and tip, add su water to the 20 cc vial to bring the total li 10 ml. Add 10 mls to the 10µ1 or 100µ1 aliqu	fficient der quid volume ot.	to
		f.	Remove the diluted sample from the hot cell w	ith tongs.	
		g.	Cap the vial. Wipe it and seal it with tape.		
		h.	Screen survey the vial to verify countability contact).	(<u>≺</u> 5 mR/hr	
		i.	Label and bag the vial noting the dilution, t volume used, and the radiation level measured	he aliquot	
		j.	Set the sample aside for transport to the TSC room.	or counting	
		k.	If a chemical analysis for Boron is to be per below to Section 4. If no chemical analysis performed, proceed below to Section 6 to clea the hot cell for later use.	formed, proc is to be n up and sec	eed ure
	4.	Analy	vsis of Liquid Sample for Boron		
		This modif Samp	section is a version of CAP C-17 "BORON COLOR fied to permit the application to highly radio le manipulations are performed primarily within	METRIC", active sampl n the hot ce	es. 11.
		It is for t assen	assumed that the reagents, equipment and sup this procedure (which are itemized in Appendix abled for use as specified in Section 1.b.	plies requir 1) are	ed

DIABLO CANYON P	OWER PLANT UNIT NO(S) 1 AND 2 OST-ACCIDENT SAMPLING SYSTEM RCS LIQUID SAMPLE HANDLING	NUMBER EP RB-15:E REVISION O DATE 7/17/84 PAGE 8 OF 15
a.	Pipet 5.00 ml of the standard boric acid sol ml volumetric flask and dilute to the mark w The concentration of boron in this flask is actual concentration of the standard solutio 10 ppm). Note the actual concentration in t this standard as a check on the calibration	ution into a 100 ith demin water. 1/20 of the n (approximately he flask and run curve.
b.	Pipet 2 ml of the 10 ppm boron standard solu ml Erlenmeyer flask. Pipet 2 ml of demin wa second 50 ml Erlenmeyer flask. (Both these outside the hot cell.)	tion into a 50 ter into a flasks should be
с.	Open the access door on top of the hot cell.	
d.	Pipet a 2 ml aliquot of the RCS liquid sampl the receiver flask into one of the 50 ml Erl within the hot cell. (The other flask may b back-up vessel or if desired, it may be used duplicate "hot" sample.	e solution from enmeyer flasks e reserved as a to prepare a
	NOTE: Open hot cell access lid whenever som to a flask. Close it immediately aft	ething is added erwards.
е.	Pipet 10 $\mu 1$ of concentrated HC1 to each flas swirl. Allow flasks to cool (\sim 2 minutes).	k stopper and
f.	Add 10.0 ml of concentrated H_SO4 into each and swirl. Allow flasks to cool room temper minutes).	flask, stopper ature (∿ 15
g.	Add 10.0 ml of carminic acid solution into e Stopper again and, using tongs, swirl to mix	ach flask. well.
h.	Turn on the spectrophotometer and allow it to Absorbance should be read 45 to 60 minutes a acid is added. Note the time.	o warm up. fter carminic

 SENTRY POST-ACCIDENT SAMPLING SYSTEM RCS LIQUID TITLE AND GAS SAMPLE HANDLING i. Being careful to avoid direct hand contact with the cuvettes, between approximately 40 and 55 minutes after the carminic add, transfer solutions to clean, prewiped 1 cm cuvettes and carefully cap them. This may be accomplished using a 5 ml pipet set for 4 ml, and, in the case of the 	OF 15
i. Being careful to avoid direct hand contact with the cuvettes, between approximately 40 and 55 minutes after the carminic add, transfer solutions to clean, prewiped 1 cm cuvettes and carefully cap them. This may be accomplished using a 5 ml pipet set for 4 ml, and, in the case of the	the state of the s
performed using tongs.	9
j. Set the spectrophotometer to a wavelength of 585 nm and adjust the blank for 0% absorbance.	
k. Read the boron standard to verify agreement with calibratio graph within ±5%. If this agreement is not obtained continue the analysis but inform supervision immediately.	n
 Read the absorbance of the sample(s). Record results and return the samples to the hot cell. 	
(Absorbance RCS)	
Calibration Graph (Standard Curve)	
ppm Boron RCS (diluted) =ppm	
Record this on the data sheet in EP RB-15:F, Section (4)	
m. Notify the Site Chemistry and Radiation Protection Coordinator of results of sample analysis.	
n. Turn the spectrophotometer off and proceed to Section 5 below.	
5. Dilution and Preparation of Off-gas for Isotopic Analysis	
NOTE: Perform steps below only if sample vial dose rate is >5 mR/hr.	
a. Obtain a clean 14 cc gas sample vial with a septum installe and using a 5 ml gas tight syringe, withdraw 1 cc of air from the vial and discharge the air from the syringe.	łd

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DIABLO	CAN	YON P	OWER	PLANT	UNIT NO(S) 1 AND 2	NUMBER EP RB-15:E REVISION O DATE 7/17/84 PAGE 10 OF 15
TITLE	SEN	GAS	OST-AC SAMPLE	CIDEN HAND	IT SAMPLING SYSTEM RCS LIQUID	
		b.	Inse lcc. vial	srt th Shu	e syringe into the off-gas sample t the valve on the syringe before	vial and remove removing the
		c.	Inse	ert th syrin	e syringe into the counting vial; ge and inject the contents into th	open the valve on ne vial.
		d.	Surv mR/h clea thar	rey th r, re n 14 5 mR	e newly prepared vial; if the dose peat steps a. through e. above, di cc gas sample vials until the samp /hr, keeping track of the number of	e rate is >5 iluting into new ple vial is less of dilutions.
		e.	Plac as f fact 15:1	e a 1 ound or by . Re	abel on the counting vial repeating on the original vial. Calculate to multiplying all dilutions togethe cord this information on the data	ng the information the new dilution er. Each dilution sheet.
		f.	Inqu shou dire	ire f ild be cted.	rom supervision whether the origin discarded or stored for future us	nal sample vials se and perform as
	6.	Clea	ining	and S	ecuring the Hot Cell	
		à.	Clea	ning		
			1)	Disp	osal of Radioactive Sample Residue	15
				Duri area may disc	ng these actions, the radiation le and airborne concentrations with become higher since the sample mat harged via the sink.	evels in the sink in the Sentry Room terials are being
				a)	Turn on sink drain faucet to prov steady stream.	vide a slow,
				b)	Open receiver funnel drain valve liquid resides down the drain.	to empty the
				c)	Flish the drain lines with about using demin water twice, followed flushes and two more demin water	20 ml flushes d by two caustic flushes.

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DIABLO CANYON POWER	PLANT	UNIT NO(S) 1 AND 2	NUMBER EP RB-15:E REVISION O DATE 7/17/84 PAGE 11 OF 15
TILE AND GAS SAMPL	ACCIDEN LE HAND	T SAMPLING SYSTEM RCS LIQUID LING	FAGE II OF 15
	d)	Open the access port on top of the Remove sample caps using tongs and remote handling device, empty out the flasks remaining in the enclos receiver flask drain. (Be careful the receiver flask drain).	hot cell. , using the the contents of ure down the not to overfill
	e)	Flush out the sample flasks and wa contaminated handling tools with d caustic or acid wash solutions (as followed by a demin water rinse.	esh off all memin water, appropriate),
	f)	Perform a general washdown of the remove contamination. Close the a finished inside the hot cell.	hot cell to ccess port when
	g)	Store sample flasks, vessels, etc. materials not to be used again thoroughly cleaned and inspected.	as "dirty" unless
2)	Disp	osal or Storage of Chemicals, etc.	
	a)	Dispose of waste chemicals, materi similar fashion as above for the r vessels. (Of course the precautio radioactivity should not apply).	als, etc. in a adioactive ns regarding
	b)	Chemicals, reagents and other supp consumed or compromised during the may be stored for later use. Thes in the cabinet space adjacent to t	lies not sample analyses e may be stored he sink area.
b. Sec	uring	Equipment	
1)	Valv	es	
	a)	Verify the sample receiver funnel shielded sample enclosure is valve lines have been thoroughly flushed clean.	within the d shut after the and surveyed
	b)	Verify that the sink water flow is	secured off.

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DIABLO CANYON POWER	NUMBER EP RB-15:E REVISION 0 DATE 7/17/84
SENTRY POST-A TITLE AND GAS SAMPL	CIDENT SAMPLING SYSTEM RCS LIQUID HANDLING
2)	Ventilation
	a) If the hot cell and all survey/access ports are secured, the ventilation flow via the overhead duct may be turned off, provided there is no other requirement for this system.
3)	When ready to do so, transfer samples to the TSC or counting room for counting.
4)	Turn all ventilation OFF when leaving the Sentry Room unless the Sentry Room will be used in the near future.
5)	When exiting through the Motor Repair Shop, note the pressures of the gas supply bottles.
	Argonpsig
	Cal Gas 1psig
	Cal Gas 2psig
6)	Close the bottle isolation valves for the Sentry supply

DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 SENTRY POST-ACCIDENT SAMPLING SYSTEM RCS LIQUID TITLE AND GAS SAMPLE HANDLING	EP RB-15:E 0 7/17/84 13 OF 15
APPENDIX 1	
CHECKLIST OF REQUIRED EQUIPMENT AND SUPPLIES	
PERSONNEL PROTECTION AND EVALUATION (PRIOR TO PLANT ENTRY)	CHECK
<pre>Exposure rate survey equipment; 1 device/individual, including: 1 teletector for Sentry Room use (as a minimum) Balance comprised of teletectors, RO-2A's or ecuivalent devices SCBA respirators; 1 device/individual SCBA spare breathing air bottles; 3 bottles/individual (in Sentry Room Full set of protective clothing with duct tape; 1 set/individual Heavy rubber gloves (or two pair regular rubber gloves); 1 set per individual Normal and accident range dosimeters (pencil dosimeters and TLD's); 1 set/individual Extremity dosimeters for hands; 1 set/individual Lapel air samplers (recommended); 1 sampler/individual Voice communication amplifier (compatible with mask); 1 unit/individual GENERAL SAMPLE HANDLING AND MANIPULATIONS (Sections 1, 2, and 6)</pre>	
Fully operable hot cell (located in Sentry Room) Sample shield brick (with pre-bored holes) Long extension tongs: 14-16" in length, (2 pairs) RO-7 w/RO-7-BM probe and 5' cable Acid cleaning solution (1 gallon) Caustic cleaning solution (1 gallon) Demin water jug (5 gallons) Suction bulb Rubber hose (5' long with trigger spray nozzle and tap hook-up)	

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DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 TITLE SENTRY POST-ACCIDENT SAMPLING SYSTEM RCS LIQUID TITLE AND GAS SAMPLE HANDLING	NUMBER E REVISION C DATE 7 PAGE 1	P P.E /17/ 4 C	8-15:E /84 0F 15
APPENDIX 1 (Continued)			
GENERAL SAMPLE HANDLING AND MANIPULATIONS (Sections 1, 2, and	d 6) (Continu	cd)	
CENTE STATE TARGETA AND TRATICEATIONS (SECTIONS 1, 2, and		eu)	
30 ml beakers (3)		[]
Paper towels or equivalent (1 box)]]
Alcohol (1 liter)		[]
RADIOACTIVE SAMPLE DILUTION SUPPLIES (SECTION 3)		СН	ECK
20 ml liquid scintillation vial w/cap (1)		[]
Sealing tape for 20 ml liquid scintillation vial (1 roll)		L	1
Eabers for 20 mi inquid scintillation vial (1 box)		L	1
10 vl pipet w(tip		L	1
1 ml pipet w/tip		L	
Adjustable 0-5 ml pipet w/tip		r	1
Shielded suringe (calibrated for 5 cc volume)		r	1
Spare syringe cylinder		r	7
BO 'ON SAMPLE ANALYSIS SUPPLIES (SECTION 4)			
50 ml Erlenmeyer flasks w/rubber stoppers (4 sets)		ſ	1
1 cm path length spectrophotometer cells w/caps (3 sets)]]
Dri-wipes for spectrophotometer cells (1 box)]]
Rinse/soak bath for 1 cm path length spectrophotometer cells		[]
100 ml volumetric flask		[]
1			
*Reagents <u>must</u> be stored in boron free containers; use plasti	c		
DC0294 141V			

DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 SENTRY POST-ACCIDENT SAMPLING SYSTEM RCS LIQUID	NUMBER REVISION DATE PAGE	EP RB 0 7/17/ 15 0	-15:E 84 F 15
TITLE AND GAS SAMPLE HANDLING			
NUMBER EP RE-18 TITLE SENTRY POST-ACCIDENT SAMPLING SYSTEM RCS LIQUID APPENDIX 1 (Continued) APPENDIX 1 (Continued) APPENDIX 1 (Continued) Adjustable 0-5 ml pipets (2) w/tips (1) []] 10 ul pipet w/tips (3) []] Spectrophotometer unit []] Dilute nitric acid, HNO3 (bath) []] Carminic acid solution ¹ , Stability: 1 week (30 ml/analysis) []] Sufficience acid ¹ , HC1, concentrated (30 ml/analysis) []] Standard boric acid solution ¹ , 200 ppm B, Stability: Restandardize monthly (5 ml/analysis) []] DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5) []] Ac gas sample vials w/septums installed (2) []] Sc cg as tight syringe/needle []] Labels for 14 cc gas vials []] Sealing tape []] CONTAINMENT AIR FRACTIONATION SUPPLIES Spare U-tube filter assembly []]			
BORON SAMPLE ANALYSIS SUPPLIES (SECTION 4) (Continued)			
Adjustable 0-5 ml pipets (2) w/tips (1)		г	1
10 µl pipet w/tips (3)		ſ	1
Spectrophotometer unit		I	1
Dilute nitric acid, HNO3 (bath)		ī	j
Carminic acid solution ¹ , Stability: 1 week (30 ml/analysis)		ī	j
Hydrochloric acid ¹ , HCl, concentrated (30 ml/analysis)]	1
Sulfuric acid ¹ , H ₂ SO ₄ , concentrated (30 ml/analysis)		1	1
Standard boric acid solution ¹ , 200 ppm B, Stability: Restanda	rdize		
monthly (5 ml/analysis)			
ABLO CANYON POWER PLANT UNIT NOIS) 1 AND 2 SENTRY POST-ACCIDENT SAMPLING SYSTEM RCS LIQUID THE AND GAS SAMPLE HANDLING APPENDIX 1 (Continued) APPENDIX 1 (Continued) Adjustable 0-5 ml pipets (2) w/tips (1) 10 wl pipet w/tips (3) Spectrophotometer unit Dilute nitric acid, MD, (bath) Carminic acid solution ¹ , Stability: 1 week (30 ml/analysis) Mydrochloric acid ³ , H2SO ₄ , concentrated (30 ml/analysis) Sufuric acid ³ , H2SO ₄ , concentrated (30 ml/analysis) Standard boric acid solution ¹ , 200 ppm B, Stability: Restandardize monthly (5 ml/analysis) DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5) 14 cc gas sample vials w/septums installed (2) 5 cc gas tight syringe/needle Labels for 14 cc gas vials Small plastic bags; sealable Sealing tape <u>CONTAINMENT AIR FRACTIONATION SUPPLIES</u> Spare U-tube filter assembly		CH	ECK
14 cc gas sample vials w/septums installed (2)		[·]
5 cc gas tight syringe/needle		[]
Labels for 14 cc gas vials		[]
Small plastic bags; sealable		[]
Sealing tape		[]
CONTAINMENT AIR FRACTIONATION SUPPLIES			
Spare U-tube filter assembly		[]

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	Pacific Gas and Electric Company NUMBER EP RB-15 DEPARTMENT OF NUCLEAR PLANT OPERATIONS DATE 7/17/84 DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 DATE 7/17/84 TITLE EMERGENCY PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM DATA ANALYSIS 0 DATE 7/27.94
	APPROVED:
DIS	IMPORTANT TO ENVIRONMENTAL QUALITY
The dat for	purpose of this procedure is to provide a means to assemble the a generated from the various EP RB-15 sub-procedures into a concise m.
PRO	CEDURE
1.	RCS stripped gas data are to be processed on Section (1) of form 69-9393.
2.	Hydrogen data from Containment atmosphere analysis by the in situ Hydrogen Analyzer System are to be processed on Section (2) a) of form 69-9393.
3.	Hydrogen data by Sentry Gas Chromatographic analysis are to be processed on Section (2) b) of form 69-9393.
4.	Containment Air Isotopic Data are to be processed on Section (3) of form 69-9393.
5.	Analytical data for boron is to be processed on Section (4) of form 69-9393.
6.	Depressurized liquid isotopic data are to be processed on Section (5) of form 69-9393.
7.	After filling in the pertinent sections of form 69-9393, acquire approval signatures from the Chemistry and Radiation Protection Foreman and the Chemistry and Radiation Protection Engineer.
8.	Attach all pertinent chemistry and radiochemistry data to this form.
9.	Deliver the completes form to the Site Chemistry and Radiation Protection Coordinator for disposition.

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PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

TITLE: POST ACCIDENT RCS AND CONTAINMENT AIR SAMPLE DATA SHEET	(EP RB-15:F)
DATE	DAY
(1) ANALYST INITIALS	
RCS Off-Gas Data (GAMMA ASSAY)	
P ₁ = Pressure Recorded on RC-G-2.1 (EP RB-15:B, step 15.e.)	psig
P ₂ = Pressure Recorded on RC-G-2.1 (EP RB-15:D, step 4.i.)	psig
Calculate the Gas Dilution Factor (DF):	
$DF_1 = \frac{V_1(P_1 + 14.7)}{V_2(P_2 + 14.7)} = \frac{A_1}{A_2}, \text{ where}$	
\dot{n}_1 - Initial activity isolated in sample line up to RC-V-19	5 before GC Analysis
V_1 = System Volume (RC-EV-1 and lines to RC-V-15) = 360 cc	
P ₁ = Pressure Recorded Above	
A ₂ = Final Activity after GC analysis, the time at which the collected	ne off-gas sample is
$V_2 = Volume of RC-DV-2 = 0.023 CC$	
P ₂ = Pressure recorded above	
DF ₁ =	
Initial Counting Vial Dilution Factor = $11 = DF_2$	11
NOTE: When the syringe is first injected into the 10 cc Sentry sample bottle and then the plunger is withdrawn to 1 cc, (provided the syringe is still inserted in the 10 cc bottle) the total volume is 11 cc. If the sample is homogeneous, then the true Dilution Faction = 11, not 10.	
Subsequent dilution factor for lcc \rightarrow 14cc results in a multiplication factor of 15 for each dilution = DF ₃ (Use 1 if no subsequent dilutions are needed)	
NOTE: The same argument based in the previous note applies here. The DF = 15, not 14.	
Total dilution factor is $DF_1 \times DF_2 \times DF_3 =$	2 (- 33)

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DATE		DAY	
	ANALYST INITIAL	s	
(2)a) Hydrogen Concentration	in Containment	Air (15:A)	
OPTION 1: Hydrogen Analyzer S	ystem		
	CEL-82	CEL-83	
Time switched from OFF to STANDBY (N/A if in STANDBY mode before this date) (15:A Step 4.a.1)			
Scale Used (10% or 20%) Step 10)			
Meter Reading (%) Step 10)			
Time Step 10)			
Analyst's Initials			
69-9393 7/84 (10)		Page 3 of 6	
--	---------------------------	-------------	
TITLE: POST ACCIDENT RCS AND CONTAINMENT	AIR SAMPLE DATA SHEET (EP	RB-15:F)	
DATE	DAY		
ANALYST INIT	TALS		
(2)b) Hydrogen Concentration in Containm	ent Air (15:D)		
OPTION 2: Hydrogen by Gas Chromatogra	ph		
Loop Used (1,2,3, or 4)			
Sample Time	-		
Standard Calibration Reference Pressure* (from Calibration Sheet)	(Psia)	
Peak Height, H (EP RB-15:D, Step 4.n.)	_	(mm)	
Peak Height Correction Factort, CF, (From	Calibration Sheet)		
Corrected Peak Height, H_c ($H_c = H \times CF$)	_	(mm)	
% H ₂ (From Standard Calibration Curve)	_	<u> </u>	
Analyst's Initials			

* To convert to absolute pressure (Psia):

for pressure >0: 14.7 + pressure reading (Psig)

for pressure <0: 14.7 - (vacuum reading in inches Hg) 2.03

+ Correction Factor for Peak Height:

Peak Height at Standard Calibration Pressure Peak Height at Sampling Pressure

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°K

TITLE: POST ACCIDENT RCS AND CONTAINMENT AIR SAMPLE DATA SHEET (EP RB-15:F)

(3) Containment Air Isotopic Analysis

Containment Temperature, Tc (EP RB-15:C, Step 1.e.)

Containment Noble Gas

Fractional Yield = Tc/(43,400 x Ts) = Yng

Noble Gas Activity = _____uCi/cc

Containment Air Iodine

Fractional Yield = Tc/Ts = ____YIP Iodine and Particulate Activity = ____UCi/cc Counted By _____

Where: Y_{IP} and Y_{NG} are fractional yields entered into the analysis program.

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TITLE: POST ACCIDENT RCS AND CONTAINMENT AIR SAMPLE DATA SHEET (EP RB-15: F)

(4) Chemical Analysis

Boron

Concentration from analyses, B	PPM
SYSTEM DILUTION FACTOR, DF, Usually 1000	
Corrected Concentration, C.C., (BxDF)	РРМ
Supplemental Dilution Factor, S.D.F., (1 if, no other chemistry dilutions are performed	
Final Corrected Concentration (C.C.xS.D.F.)	PPM

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TITLE: POST ACCIDENT LIQUID SAMPLE DATA SHEET IPLSS DATA EP RB-15:G

(5) Liquid Isotopic Analysis (15:E Step 3)

Volume Sample Used

5m1 1m1 100µ1 10µ1

I	nitial Dilution Factor	(DF ₁)
A	dditional Sample Dilution Factor (DF)	
	(use 1 if there is no additional DF)	(DF ₂)
	$(DF_1 \times DF_2)$	(DF ₃)
F	ractional Yield to be entered into Isotopic Program 1/DF ₃	(Y ₂)

	Radiation
Reviewed by Foreman	Protection

	Pacific Gas and Electric Company T OF NUCLEAR PLANT OPERATIONS YON POWER PLANT UNIT NO(S) 1 AND	NUMBER REVISION DATE 2 PAGE	EP RB-15:G O 7/17/84 1 OF 4
APPROVED	MERGENCY PROCEDURE ENTRY POST-ACCIDENT SAMPLING SYST - SAMPLE STORAGE AND DISPOSAL R. C. Thombor PLANT MANAGER	TEM 	
DISCUSSION			
The purpose o stripped-gas	f this procedure is to provide a samples and storage of RCS liquid	means for disposal d samples.	of
PRECAUTIONS			
1. Same as	EP RB-15:A.		
PREREQUISITES			
1. Modified	GE-8300 transfer cask.		
2. Gas bott	le Griptong.		
3. 10 cc ga	s sample bottle.		
PROCEDURE			
1. Disposal	of Reactor Coolant Stripped-Gas	Samples	
a. At	the LSP		
1)	Close or check closed valves. RC-V-1.1 through RC-V-1.5		[]
2)	Verify that RC-G-4 indicates ap 100 psig Ar.	oproximately	[]
b. At	the PCP		
1)	Close or check closed		
	FCV-9351A, FCV-9351-B FCV-9350A, FCV-9350-B FCV-9353A		

DCO118 1II

DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-15:G REVISION O
SENTRY POST-ACCIDENT SAMPLING SYSTEM TITLE SAMPLE STORAGE AND DISPOSAL	DATE 7/1//84 PAGE 2 OF 4
FCV-692, FCV-693, FCV-694 [] FCV-1412, FCV-1413 [] FCV-1416, FCV-1417, FCV-1418 [] FCV-1419, FCV-1420 []	
c. Align the following valves:	
RC-V-10 (closed) []] RC-V-15 (closed) []] RC-V-14 (closed) []] RC-V-14 (closed) []] RC-V-13 (closed) []] RC-V-12 (closed) []] RC-V-2 (9 o'clock) []]	
d. Bottle Evacuation	
 With the griptong, install the diluted of bottle on the front panel needle. 	gas sample []
2) Open RC-V-13.	Ĺ Ĵ
 Open RC-V-12 and evacuate until RC-G-2.2 minimum vacuum of 22 inches mercury. 	indicates a []
4) Turn RC-DV-2 to the 6 o'clock position a evacuation until a minimum vacuum of 22 mercury is indicated on RC-G-2.2	nd continue the inches of []
5) Close in order RC-V-13 and RC-V-12.	[]
6) Open RC-V-14 and allow the bottle to pre approximately 1 psig as indicated on RC-	G-2.2. []
7) Close RC-V-14.	[]
 Open RC-V-13 and RC-V-12 and evacuate un indicates a minimum vacuum of 22 inches 	til RC-G-2.2 mercury. []
9) Close in order RC-V-13 and RC-V-12.	[]

DIABLO CAN	NYON P ENTRY - SAMP	OWER PLANT UNIT NO(S) 1 AND 2 REVISION DATE POST-ACCIDENT SAMPLING SYSTEM LE STORAGE AND DISPOSAL	EP RB-15:G O 7/17/84 3 OF 4
		 Open RC-V-14 and allow the bottle to pressurize to approximately 1 psig as indicated on RC-G-2.2. 	° []
		11) Close RC-V-14.	[]
		 Repeat steps 8 through 11 three times to remove a radioactive gases. 	"[]
	e.	Bottle Disposal	
		1) Remove the griptong from the panel.	[]
		 Perform a radioactive survey of the bottle and dis accordingly. 	pose []
2.	Acce	ess and Removal of Diluted RCS Liquid Sample Bottle	
	a.	Open the Sentry cart/cask.	[]
	b.	Align the modified GE-8300 transfer cask over the Sentr cart/cask cavity.	., Г]
	с.	Withdraw the tungsten shield at the base of the transfe cask.	er []
	d.	Slowly lower the sample bottle access mechanism until t latch grasps the sample bottle.	he []
	e.	Slowly raise the sample bottle into the cavity of the transfer cask.	[]
	f.	Close the tungsten shield at the base of the transfer cask.	[]
	g.	With two persons (one at each arm of the transfer cask) carefully move the bottle to the storage location.	'[]
	h.	Place the transfer cask on the sample bottle storage platform.	[]
	i.	Withdraw the tungsten shield at the base of the transfe cask.	۲ []

DCO118 3II

DIABLO	CANYON PO	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-15:G REVISION O DATE 7/17/84
TITLE	SENTRY F SAMPL	POST-ACCIDENT SAMPLING SYSTEM LE STORAGE AND DISPOSAL	PAGE 4 OF 4
	j.	Slowly lower the sample bottle to the platfo the downward movement until the sample bottl released.	e is []
	k.	Raise the bottle access mechanism and close shield.	the tungsten []
1	DC0118 4	II	

	Pacific ARTMENT OF NUCL BLO CANYON POWE EMERGENCY SENTRY PO E SUBSEQUEN	Gas and Electric Company EAR PLANT OPERATIONS IR PLANT UNIT NO(S) 1 AND 2 OPERATING PROCEDURE ST ACCIDENT SAMPLING SYSTEM T SAMPLING	NUMBER REVISION DATE PAGE	EP RB-16 O 7/18/84 1 OF 4
APP	ROVED	R. C. Thombur PLANT MANAGER	7-31-84 DATE	
SCOPE		EN	IMPORTANT	TO
for sam in a po point d 1 and 4 Dischar Equipme Atmosph be perf	pling the react st-LOCA situati uring emergency , Pressurizer (ge (Pumps 1-1 a nt Drain Receiv ere. The samp crmed during a	tor coolant, radwaste, and c ion. The samples which can y conditions are: Reactor C (PZR) Liquid, Pressurizer St and 1-2), VCT Liquid, Reacto ver, Floor Drain Receiver, a les which can be obtained an n emergency condition are:	containment atmosp be collected at t colant (RC) Hot L eam, RHR Pumps r Cavity Sump, nd Containment d analyses which	ions here his egs can
1. Fo	r RC (Reactor (Coolant) Samples:		
a.	In-Line Pres Chromatograp	ssurized Flask with Off-Gasi ph Analysis.	ng for Gas	
b.	Remote colle Cart/Cask As	ection of Undiluted RC Sampl ssembly for Transport Off-Si	es in a Shielded te.	
c.	Dilute RC Sa (Boron).	amples (Diluted 1-1,000) for	On-Site Analysis	
d.	In-Line Chem Conductivity	nical Analyses on Undiluted y, Chloride, Dissolved Oxyge	RC Samples for pH n.	
e.	Diluted Stri	ipped Gas Samples		
2. For	r RW (Radwaste)) Samples:		
a.	Remote Colle Cart/Cask As	ection of Undiluted RW Sampl ssembly for Transport Off-Si	es in a Shielded te.	
		malas (Diluted 1 1 000) for	On-site Analysis	
b.	Dilute RW Sa (Boron).	amples (Diluted 1-1,000) for		

				NUMBED ED DR-16
DIABLO	CANY	ON POWER PLANT U	UNIT NO(S) 1 AND 2	REVISION O DATE 7/18/84 PAGE 2 OF 4
TITLE	SEN SUB	TRY POST-ACCIDE SEQUENT SAMPLIN	NT SAMPLING SYSTEM G	
	3.	For CA (Contai	nment Air) Samples:	
		a. Remote Co	llection of Undiluted Samples.	
		b. In-Line G	as Chromatographic Analysis.	
		c. Dilution	with Subsequent Sample acquisit	ion by syringe.
	These samp	e procedures al les.	so include complete module flus	hing after obtaining
	This requ	procedure and ire PSRC review	the procedures listed below, an	d changes thereto
	NOTE	: This procedu designed to r acquisition.	re <u>does not</u> apply to the initia meet the 3-hour time requiremen	l sample exercise t for sample
	PROCI	EDURE		
	1.	Specific Proce	dures	
		The detailed i the Scope of t sub-procedures	nstructions for performing the his procedure are covered in th :	sampling outlined in e following
		EP RB-16:A	Sentry Lab Access/Egress and In	itial Actions
			This procedure details necessa accessing and egressing the la startup, initial system lineup testing prior to the first sam an accident.	ry steps for b, Gas Chromatograph , and annunciator ple exercise during
		EP RB-16:B1	Diluted Liquid Sampling from R	leactor Coolant
			This procedure details the ste obtain a diluted liquid sample coolant sources.	ps required to from reactor
		EP RB-16:82	Undiluted Liquid Sampling from	Reactor Coolant
			This procedure details the ste	ps required to

coolant.

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NABLO CANYON POWER P	LANT UNIT NO(S) 1 AND 2	NUMBER EP RB-16 REVISION O DATE 7/18/84 PAGE 3 OF 4
TLE SUBSEQUENT SAM	CIDENT SAMPLING SYSTEM	
<u>EP</u> RB-16:8	3 Reactor Coolant Stripped Gas S Radioassay and Gas Chromatogr	Sampling For raphic Analysis
	This procedure details the ste obtain a stripped gas sample f sources and make it available chromatographic analysis.	eps required to from reactor coolant for gas
EP RB-16:8	4 Diluted Liquid Sampling from R	Radwaste
	This procedure details the ste obtain a diluted sample from r	eps required to radwaste sources.
EP RB-16:8	5 Undiluted Liquid Sampling from	n Radwaste
	This procedure details the ste obtain an undiluted liquid sam sources.	eps required to nple from radwaste
EP RB-16:0	Containment Air Sampling	
	This procedure details the ste containment air available for analysis and to dilute contain isotopic analysis.	eps required to make gas chromatograph mment air for
EP RB-16:0	Gas Chromatographic Hydrogen An Gas or Containment Air	nalysis Stripped
	This procedure details the ste analyze a stripped-gas or cont by gas chromatography.	eps required to cainment air sample
EP RB-16:E	Post Accident RCS Liquid and Ga	s Sample Handling
	This procedure details the ste prepare (1) a diluted liquid s	eps required to sample for boron

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DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2

SENTRY POST-ACCIDENT SAMPLING SYSTEM TITLE SUBSEQUENT SAMPLING NUMBER EP RB-16 REVISION O DATE 7/18/84 PAGE 4 OF 4

analysis, (2) a diluted off-gas sample for γ -assay, (3) a diluted liquid sample for γ -assay and (4) a diluted containment air sample for γ -assay.

EP RB-16:F -- Data Analysis

This procedure provides a standard format to record data obtained in the EP RB-16 procedures.

EP RB-16:G -- Ion Chromatographic Chloride Analysis

This procedure details the steps required to measure the chloride concentrations from the sample sources available at the Reactor Coolant module of the LSP.

EP RB-16:H -- pH/Conductivity/YSI Dissolved Oxygen Analysis

This procedure details the steps required to perform pH/conductivity and YSI Dissolved oxygen analysis on a reactor coolant sample.

EP RB-16:I -- Undiluted Containment Air Sampling

This procedure details the steps required to obtain an undiluted containment air sample in a cart/cask for gross isotopic analysis.

EP RB-16:J -- Sample Storage and Disposal

This procedure details the steps required to dispose stripped-gas samples and to store RCS liquid samples.

REFERENCES

- Sentry High Radiation Sampling System Operations and Maintenance Manual
- 2. NUREG 0737

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PG	Pacific Gas and Electric Company	NUMBER REVISION	EP RB-16:A O
0	DEPARTMENT OF NIKLEAR PLANT OPERATIONS	DATE	7/14/84
U	DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 EMERGENCY OPERATING PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM TITLE INITIAL ACTIONS DURING AN EMERGENCY (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	PAGE	1 OF 24
	APPROVED R. C. Thomber 7- PLANT MANAGER	31-84 DATE	

PURPOSE

IMPORTANT TO ENVIRONMENTAL QUALITY

The purpose of this procedure is to define some of the actions taken when a decision is made by the Site Emergency Coordinator to obtain a post accident sample using the Post Accident Sample System (PASS).

This procedure guides, with consideration of plant emergency radiation hazards, the Sentry team to access and make operable the Sentry room. It also guides the team to withdraw from the Sentry room upon sample acquisition. This procedure and changes thereto requires PSRC approval.

DISCUSSION

This procedure ensures sample recovery with a minimum risk to personnel in a limited time frame.

The movable shield at the south entrance of the Sentry Room should normally block that access route. Therefore ingress and egress may be required across the RCA boundary. Performance of this procedure may require the transfer of radioactive samples to non-RCA's. For these reasons this procedure involves exemptions from certain routine RCA access requirements. Personnel implementing this procedure should be covered by an SWP during an accident, drill, or drill-like training. Routine use of the Sentry room is covered by the C&RP routine sampling RWP.

Particularly hazardous or unexpected conditions may occur in post accident situations. Direction by appropriate supervision may augment or supercede portions of this procedure because every possibility cannot be anticipated.

DIABLO	SE	YON POWER PLANT UNIT NO(S) 1 AND 2 ENTRY POST-ACCIDENT SAMPLING SYSTEM - INITIAL ACTIONS DURING AN EMERGENCY NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER EP RB-16:A REVISION O DATE 7/14/84 PAGE 2 OF 24								
	PREF	REQUISITES AND PRECAUTIONS									
	 The Site Emergency Coordinator should pre-plan post-accident sampling with the Emergency Radiological Advisor and the Site Chemical and Radiation Protection Coordinator prior to ordering a plant entry (i.e., prior to deciding to collect a post-accident sample) when unusually hazardous radiation or contamination levels are known or suspected to exist. 										
	2.	A sufficient number of properly qualified personne the task should be available prior to making the p sample decision. This might include:	el to complete post accident								
		a. Two people on the Sentry team; one of whom is C&RP Technician and the other an Unescorted F Worker.	s a qualified Radiation								
		b. A sample transporter qualified as a C&RP Tech	nnician.								
		c. A count room qualified person in the TSC lab.									
	3.	The Work Permit will specify protective equipment. conditions warrant less stringent requirements, it that full PC's, SCBA's and accident dosimetry be w	. Unless t is suggested worn.								
	4.	The Sentry team will make a post-accident entry to when directed by supervision and when possessing a portable survey meter to permit surveying into are radiological conditions.	o the plant only a high range eas of unknown								
	5.	The Sentry team should be informed of plant status to significant hazards, both radiological and non- along access routes.	s as it pertains -radiological,								
	6.	Exposure hazards, both airborne and direct radiati Sentry room should be monitored remotely for pre-e locally for tracking while sampling.	ion, in the entry status and								
		a. Use the Eberline Control Terminal(s) in eithe Control or the cold machine shop to remotely SPING air monitor in the Sentry room, which o locally.	er Access address the can be read								

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	DIABLO CAN	YON POWER PLANT UNIT NO(S) 1 AND 2 ENTRY POST-ACCIDENT SAMPLING SYSTEM - INITIAL ACTIONS DURING AN EMERGENCY NOT INTENDED TO MEET_THE 3-HOUR TIME LIMIT)
 Communications are vital during a plant emergency. Entry teams musupervision. C&RF Technicians have the AC4 N key required for access to areas and equipment related to this procedure and have security key cards to enter door #116. If the Sentry team does not possess either of these then take the applicable master keys located in the lock box in the R.P. office. The key to the S' elev. post-accident equipment locker is number 37, located in the key cabinet in the R.P. office. The key to the S' elev. post-accident equipment locker is number 37, located in the key cabinet in the R.P. office. The key to the S' elev. post-accident equipment locker is number 37, located in the sentry room only. These switches require a key to operate. Keys are located in the Control Room, R.P. office, and in the Sentry room to a keybox with a breakable glass cover. These valves are to be opened only during an emergency or for testing. It is important to conduct operations in an expeditious manner to provide timely vital plant status information. PECEDUEE Access to Sentry Room Area. Via Turbine Building at 85' Elevation Sarting at the Cold Machine Shop proceed into the hallway to door #125c, proceed north to door #122 and exit building. From here turn south and enter door #122 to the Motor Repair shop. 		b. Area radiation monitor RE-48, in the Sentry room, can be read in the Control Room or locally.
 6. GRP Technicians have the AC4 N key required for access to areas and equipment related to this procedure and have security key cards to enter door #116. If the Sentry team does not possess either of these then take the applicable master keys located in the lock box in the R.P. office. The key to the 85' elev. post-accident equipment locker is number 37, located in the key cabinet in the R.P. office. 9. The containment isolation valves FCV-696, 697, 698, 699 and 700 are controlled from the Containment Isolation Valve Panel in the Sentry Room only. These switches require a key to operate. Keys are located in the Control Room, R.P. office, and in the Sentry room in a keybox with a breakable glass cover. These valves are to be opened only during an emergency or for testing. 10. It is important to conduct operations in an expeditious manner to provide timely vital plant status information. PDCEDURE 11. Access to Sentry Room Area 12. Via Turbine Building at 85' Elevation Starting at the Cold Machine Shop proceed into the hallway to door #125C, proceed north to door #122 and exit building. From here turn south and enter door #192 to the Motor Repair Shop. 	7.	Communications are vital during a plant emergency. Entry teams must be able to communicate with the Control Room and appropriate supervision.
 9. The containment isolation valves FCV-696, 697, 698, 699 and 700 are controlled from the Containment Isolation Valve Panel in the Sentry Room only. These switches require a key to operate. Keys are located in the Control Room, R.P. office, and in the Sentry room in a keybox with a breakable glass cover. These valves are to be opened only during an emergency or for testing. 10. It is important to conduct operations in an expeditious manner to provide timely vital plant status information. PROCEDURE 1. Access to Sentry Room Area The Diablo Canyon Shielding Review indicates that the following routes might minimize exposures. a. Via Turbine Building at 85' Elevation Starting at the Cold Machine Shop proceed into the hallway to door #125C, proceed north to door #122 and exit building. From here turn south and enter door #192 to the Motor Repair Shop. 	8.	C&RP Technicians have the AC4 N key required for access to areas and equipment related to this procedure and have security key cards to enter door #116. If the Sentry team does not possess either of these then take the applicable master keys located in the lock box in the R.P. office. The key to the 85' elev. post-accident equipment locker is number 37, located in the key cabinet in the R.P. office.
 It is important to conduct operations in an expeditious manner to provide timely vital plant status information. <u>PROCEDURE</u> Access to Sentry Room Area The Diablo Canyon Shielding Review indicates that the following routes might minimize exposures. Via Turbine Building at 85' Elevation 	9.	The containment isolation valves FCV-696, 697, 698, 699 and 700 are controlled from the Containment Isolation Valve Panel in the Sentry Room only. These switches require a key to operate. Keys are located in the Control Room, R.P. office, and in the Sentry room in a keybox with a breakable glass cover. These valves are to be opened only during an emergency or for testing.
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Starting at the Cold Machine Shop proceed into the hallway to door #125C, proceed north to door #122 and exit building. From here turn south and enter door #192 to the Motor Repair Shop.		a. Via Turbine Building at 85' Elevation
		Starting at the Cold Machine Shop proceed into the hallway to door #125C, proceed north to door #122 and exit building. From here turn south and enter door #192 to the Motor Repair Shop.



Starting at the Cold Machine Shop proceed west to the outside via door #129, turn right and continue north around the Unit 1 Turbine Building looping around the transformers at the north end of the plant. Continue south to door #192 between containment and the Turbine Building. Enter the Motor Repair Shop via door #192.



The Figure 1 pathway is preferred. However an access route other than those above may be suggested by actual post accident conditions (e.g., fire, high energy line break, etc.). The final route selected should be directed by appropriate supervisory personnel.

- 2. Initial Set-up of Sentry Room Equipment
 - a. Gas Supply Cylinders Check

The gas supply cylinders for Sentry Room equipment are located along the east wall of the Motor Repair Shop. Proceed to the gas storage rack and verify the following:

- The cylinder valves are fully open for all three cylinders.
- The manifold valves are fully open for all three cylinders.

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DIABLO	CANYON P	OWER	PLANT U	JNIT NO(S)	1	AND 2			NUMBER REVISION DATE	EP RB-16:A 0 7/14/84
TITLE	SENTRY INI (<u>NOT</u> I	POST- TIAL / NTENDE	ACCIDE ACTION ED TO E	ENT SAMPL S DURING MEET THE	ING SYS AN EMER 3-HOUR	TEM GENCY TIME LI	IMIT)		PAGE	6 OF 24
		3)	The a appro psig	argon regu oximately	ulator 1000 p	shows t sig and	tank pro	essure egulato	of r is set to	0 100
			NOTE	: If argo psig, the sp	on tank then th are cyl	pressu e cylir inder 1	ure is n nder has located	much le s to be at the	ss than 100 changed wi storage ra	lO th ick.
		4)	The at le at le 10 ps	2000 ppm a east 100 p sig.	and 10% psig an	H spa d both	an gas (regula	cylinde tors sh	rs should h ould be set	ave at
	b.	Emer vent Door	rgency tilation r Closu	Ventilat on is line ure).	ion Sys ed up p	tem Lir roceed	ne-up. to step	(Optio p 2.c.,	nal. If pr Steel Shie	oper 1d
		1)	Climb	b the lad	der to oom. (the cat AC4 N k	t walk a key requ	and cro uired).	ss to enter	the
		NOTE	: Mir	nimize the	e time	that th	he vent	room d	oors are op	ien.
		2)	Proce	eed to bre kers ON.	eaker p	anel PF	PHRS, 5	2-12.1-3	5 and check	all
		3)	Proce locat STOP	eed to the ted to the and RESE	e motor e left T pushb	contro of the utton c	breaker breaker	for fan r panel one.	s and heate and push t	rs he
		4)	EMER	LEAD (IS-	-150) i	s the p	preferre	ed syst	em.	
			a)	Open its and exhau and close	supply ust ven e all o	and ex t dampe ther da	khaust (ers (a t ampers.	dampers total o	and the su f 4 dampers	pply)
			b)	Push the controlle fan, and	START ers for heater	the EM	ttons or MER LEAD in that	n the m D suppl order.	otor y fan, exha	ust
		5)	EMER	REDUN (19 is inopen	S-151) rable.	is to b	be used	as a b	ackup if EM	ER
			a)	Open its and exhau dampers.	supply ust ven	and ex t dampe	chaust d ers and	dampers close	and the su all other	pply

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DIABLO CAN	YON PO	WERI	PLANT UNIT NO	D(S) I AND	2	REVISION	0 7/14/84
S TITLE	ENTRY - INII NOT IN	POST-	ACCIDENT SACTIONS DUR	AMPLING SYSTEM ING AN EMERGEN THE 3-HOUR TIM	CY E LIMIT)	PAGE	7 OF 24
			b) Push for heate	the START pus the EMER REDUN er 29B, in tha	hbutton on the mo supply fan, exha t order.	tor control ust fan and	lers
		6)	Return to	the Motor Rep	air Shop.		
	c.	Stee is c	1 Shield Do losed proce	oor Closure. eed to step 2.	(Optional. If th d., Radiological	e shield do Assessment.	or)
		1)	Proceed th Shop and o If the man is closed with step	hrough door #1 visually check rked portion o return to the d., Radiologic	92-A south of the the shield door' f the cable indic Motor Repair Sho cal Assessment be	Motor Repa s winch cab ates the sh p and proce low.	ir le. ield ed
		2)	Quickly pa Sentry roo pathway an	ass through the om. Remove the nd return to the	e Motor Repair Shi e cover plate from he cable winch ar	op and the m the door' ea.	S
		3)	Operate the visibly in	ne winch until ndicates the si	the marked portion hield door is close	on of the c	able
		4)	Return to	the Motor Repa	air Shop.		
	d.	Radi	ological As	sessment of Se	entry Room		
		1)	Enter the and the wa	Sentry room v	ia door #116 (an 1 (AC4 N padlock).	RCA boundar	y)
		2)	Perform a	general area	radiation survey		
			a) Note end c	high levels su of the room due	uch as might exist e to ECCS piping.	t at the sou	uth
			b) Note later	low level area	as for sample scr	een surveyi	ng
		3)	Note the r (PCP). Re	reading of RE-4 echeck it inter	48 on the Process mittently.	Control Par	nel
		4)	Monitor ai airborne l removed at there is a introduced	rborne radioad evels permit t this time. potential for into the room	tivity using the the respirator, it it should be donne airborne contam n.	SPING. If f worn, may ed anytime ination to I	be be

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DIABLO CAN	ENTRY	POST	ACCIDENT SAMPLING SYSTEM	NUMBER EP RB-16:A REVISION O DATE 7/14/84 PAGE 8 OF 24
	- INI NOT II	NTEND	ACTIONS DURING AN EMERGENCY ED TO MEET THE 3-HOUR TIME LIMIT)	
	e.	Pro	ceed to the Ventilation Control Panel.	
		1)	Check the alarms.	
			 Press TEST and note the red alarm while the audible alarm sounds. 	indicators flash
			b) Press SILENCE to stop the audible	alarm.
			c) Press ACK and note the flashing all glow steadily.	arm indicators
			d) Press RESET and note the red alarm out.	indicators go
		2)	If the NORMAL VENT switch is on, turn i	t off.
		3)	If the EMER LEAD ventilation system is not operating depress in order the SUPP HEATER pushbuttons.	desired and is LY, EXHAUST, and
		4)	Observe the appropriate indicating ligh operation of the desired ventilation li	ts for proper ne-up.
		5)	If necessary, return to step 2.b., Emery Ventilation Line-up.	gency
	f.	Cont	ainment Atmosphere Sample Line Heating	
		1)	Proceed to the CCP and position the FUN from OFF to SF1-3/GGD.	CTION SELECT
		2)	Observe the following:	
			a) The POWER ON indicator lights.	
			b) The flow monitor 20% and 100% flow on for approximately 25 seconds.	lights turn
		3)	Press the PILOT LIGHT TEST pushbutton an lights are not functional.	nd note which
		4)	Turn the HEAT TRACE POWER SWITCH to the position.	ON

DIABLO	ANYON PO	WER	PLAN	יט דו	NIT NO(S)		1 AN	D 2				RID	UMBER EVISION ATE	EP RB-16:A 0 7/14/84
TITLE	SENTRY POST-ACCIDENT SAMPLING SYSTEM INITIAL ACTIONS DURING AN EMERGENCY (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)										PAGE 9 OF		9 OF 24	
		5)	P1. EH	ace T 1	the tem 97 to th	per e d	ature : own po	select sition	swit mark	che ed	s for 260°.	E	HT 196 a	ind
	g.	Rear	Par	ne1	Access	Rol	ling S	hield (Closu	re.				
		If t Elec	tri	pani cal	el rolli Line-up	ng	shield	is clo	osed	pro	ceed	to	step 3.	•
		1)	Persh	rfo	rm this ded pane	val ls:	ve lin	e-up cl	neck	in	the r	ear	r of the	
			CA	P-V	-13 CLOS	ED	(above	the G	c)			[]	
			CA	P-V	-31 OPEN	(a	djacen	t to th	ne GC)		[]	
			CA	P-V	-32 OPEN	(a	djacen	t to th	ne GC)		[]	
			CA	SP-	V-1 OPEN	(o s	verhead upply	d on co line)	ont.	atm	os.	[]	
			CA	SP-	V-2 OPEN	(1	ower pa	art of	CASP)		[]	
			CA	SP-	V-3 OPEN	(m	id par	t of C	ASP)			[]	
		2)	Ge to pag	t the	he come- e pad eye ye on the	a-li e o e d	ong fro n the o oor.	om the east wa	cabin all a	net nd	and the o	att	tach one er to th	end
		3)	0p0 610	era: ock	te the co ing the o	ome	-a-long rway.	g until	the	ro	lling	st	nield is	
3	. Elect	trica	1 1	ine	-up									
	Proce	ed t	o ti ane	he 1	breaker pand check	pani k pi	el PYNM osition	MII, 10 ns of t	ocate	d 1 ers	eft o as f	f 1 011	the Vent lows:	
		BKR	#1	-	ON	[]	BKR	#2	-	ON	[]	
		BKR	#3	-	ON	[]	BKR	#4	-	ON	[]	
		BKR	#5	-	OFF	E]	BKR	#6	-	ON	[]	
		BKR	#7	-	ON	[]	BKR	#8	-	ON	1]	
		BKR	#9	-	ON	Ĺ]	BKR	#10	-	OFF	[]	
		BKR	#11	-	OFF	[]	BKR	#12	-	ON]]	
								MAIN	BKR	-	ON	Ĺ	1	

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DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE	EP RB-16:A 0 7/14/84							
TITLE SENTRY POST-ACCIDENT SAMPLING SYSTEM INITIAL ACTIONS DURING AN EMERGENCY (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	PAGE	10 OF 24							
4. The Containment Atmosphere Hydrogen Analyzers									
The two redundant analyzer systems' remote panels ar PCP and the CMP. Beneath each panel are the switche controlling the three sample line containment isolat The reagent gas tank (oxygen) is against the south w Sentry Room.	e betweer s for ion valve all of th	n the es. ne							
a. Initial Conditions of an Analyzer System	Initial Conditions of an Analyzer System								
1) Main power switch at remote panel in STAND	BY.	[]							
NOTE: If the power switch is OFF, then tu STANDBY and give the system six hou up. If both systems have not been for at least six hours, or are othe inoperable, use the gas chromatogra below. Record the time of switchin STANDBY	rn it to rs to war in STANDE rwise ph, step g from OF	5, F to							
 Solenoid operated sample line containment valve switches CLOSED. (FCV-235, 236, 237 238, 239, 240) 	isolatior ,	[]							
 Oxygen gas tank connected and isolation va closed. (Tank should be changed at 100 ps 	lve ig)	[]							
b. H ₂ Analyzer System(s) Operation. CE	L: 82	83							
 Turn the three sample line switches to the OPEN position. Observe the position indicating lights. 	[]	[]							
 Open the oxygen tank isolation valve and adjust regulator to 27 ± 2 psig. 	[]	[]							
 Turn the main power switch from STANDBY to ANALYZE. 	[]	[]							
4) Push the REMOTE SELECTOR attacts to gain control at this area.	[]	[]							
5) Turn the dual range switch to the 0-10% range.	[]	[]							
		 1. 1. 1. 1. 1. 1. 1. 							

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DIABLO CANYON POWER PLANT UN NO(S) 1 AND 2	NUMBER EP RB-16:A REVISION 0 DATE 7/14/84
SENTRY POST-ACCIDENT SAMPLING SYSTEM INITIAL ACTIONS DURING AN EMERGENCY (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	PAGE 11 OF 24
6) Adjust the ZERO and SPAN potentiometers until they agree with their respective values indicated on calibration sticker located under each potentiometer.	s rs [][]
7) Turn the function selector switch to SAMPLE. TIME(82) (83)	[][]
8) If both CEL 82 and 83 are to be used, repeat steps 4.b.1) to 7) for the secon system while waiting for the first syst to stabilize, which takes approximately 6 minutes.	nd Jem ([][]
9) Proceed with step 6., Initial Valve Lin while waiting for stabilization. When minutes have elapsed since switching to SAMPLE, continue with step 10) below.	e Up, 6 [][]
 Record the analyzer meter reading, the read, and the scale used. 	time [] []
Meter Reading (%) Time Scale Used	
<u>NOTE</u> : If the meter reads greater than the 0-20% scale should be used.	9%,
11) Inform the Control Room of which scale and CEL is used and ask the Control Roo if the analyzer(s) are to remain in ANALYZE or be returned to STANDBY.	m [][]
NOTE: Advise the Control Room of the reagent gas depletion and the limited lifetime of the sample pumps, which are located in the 100' El. GE area.	
12) If directed to leave the analyzer(s) in ANALYZE proceed with step 5, CMP/CAP Power Up	[][].

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DIABLO	CANY	ON PO	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-16:A REVISION O DATE 7/14/84
TITLE	SE (<u>M</u>	INIT	POST-ACCIDENT SAMPLING SYSTEM TIAL ACTIONS DURING AN EMERGENCY TENDED TO MEET THE 3-HOUR TIME LIMIT)	PAGE 12 OF 24
		с.	Standby	
			 Turn the function selector to ZERO and purge the analyzer for 6 minutes. 	[][]
			2) Turn the main power switch to STANDBY.	[][]
			3) Close the reagent tank isolation valve.	[][]
			 Turn the three sample line isolation valve switches to the CLOSED position. 	[][]
			5) Push Common Alarm to Reset	[][]
	5.	CMP/	CAP Power Up/Gas Chromatograph Startup (Option	nal)
		a.	Check the three root valve handles next to the CAP down in the vertical position to allo Argon and the Span gases to the CAP.	wc []
		b.	Open or check open CAP-V-10 and adjust instrument air pressure to 80 ± 2 psig.	[]
		c.	Open or check open CAP-V-14 and adjust argon pressure to 40 \pm 1 psig.	[]
		d.	At the CMP, turn the POWER switch to ON and ensure the red power light and the G.C.'s red colon are un.	[]
		e.	On the G.C. front panel	
			 Select attenuation factor of 250 (25 x 1) Place all function switches in the OFF (out) position. 	(0). []
			2) Depress MAN and CLEAR switches.	[]
			3) Enter "00" initiating G.C. warmup. Time	2 on
	5.	İnit	ial Valve Lineup	
		ð.	Unlock the cabinet door and the drawer lock & counter, if locked.	par under the
			 Locate a loaded filter assembly for the sample. 	containment air

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DIABLO	CANYON P	OWER	PLANT	UNIT NO(S) 1 AND 2	NUMBER REVISION DATE	EP RB-16:A 0 7/14/84			
TITLE	LE SENTRY POST-ACCIDENT SAMPLING SYSTEM INITIAL ACTIONS DURING AN EMERGENCY (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)								
		2)	Loca	te wrenches, labels, and bags.					
	b.	Valv	ve HCV uld be	-21, which is located next to the che positioned to the TO CONTAINMENT pos	emical sink sition.	·[]			
	c.	Samp indi	ple co icator	oler water valve should be turned un shows OPEN	:11	[]			
	d.	At t	the CA	SP		[]			
		1)	Inst	all a loaded filter assembly into the ainment air dilution system.	2	[]			
			The be o fitt	tubing end with the blue dab of paint n the bottom. Tighten but do not dan ings. Retighten if leakage is noted	t on it sho mage the later.	uld			
		2)	CASP	cart/cask connection for pressure in	dication.				
			a)	Engage and lock a cart/cask on its quick-disconnects.		[]			
			b)	OPEN the INLET and OUTLET valves and the BYPASS valve on the engaged cart	f CLOSE c/cask.	[]			
			c)	Connect PI-1109 (an MBIS pressure mo the engaged cart/cask. Plug it in a the selector switch to the proper ca	nitor) to nd turn rt/cask.				
		~ 1		lart/lask					
		3)	Check	< that PI-1116 is plugged in and turn	it on.	[]			
		4)	Close	e or check closed CASP-V-17.		[]			

DIABLO CANYON POWER	R PLANT UNIT	NO(S) 1 4	AND 2		NUMBER REVISION DATE	EP RB-16:A 0 7/14/84			
SENTRY POS TITLE INITIAL (NOT INTEN	SENTRY POST-ACCIDENT SAMPLING SYSTEM PAGE INITIAL ACTIONS DURING AN EMERGENCY (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)								
5)	Align C/	ASP-V-16 to th	ne CASP-DV-1	positio	on.	[]			
6)	Align CA	SP-DV-1 to CA	ASP-SF-5 posi	tion.		[]			
7)	Install	a new septum	on CASP-SF-5			[]			
e. At	the CCP:								
1)	Adjust M on CCP-0	pressure re	egulator to 1	00 psig	as indicat	ed []			
	NOTE: 1	This pressure eductor is on cound.	will drop to and Low N ₂ P	80 psi RESS al	ig when the larm will				
2)	All 11 C CLOSED:	of the CCP 3 p	position valv	e switc	thes should	be			
	AV-1	[]	SV-4.1	[]					
	SV-1.2	[]	SV-4.2	[]					
	SV-2.1	[]	SV-5	[]					
	SV-2.2	[]	AV-2	[]					
	SV-3.1	[]	SV-10	[]					
	SV-3.2	[]							
3)	The EXER Verify r	CISE STOP but ed light in k	ton should b nob is on.	e in th	ne IN positi	on. []			
4)	Annuncia	tor Test							
	a) Pus	h and hold th	ne TEST butto	n and v	verify:				
	(1)	the alarm s	ounds.			[]			
	(2)	all labeled SAMPLE FLAS	d windows fla SK window whi	sh exce ch glow	ept ISOLATE vs steady.	[]			

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DIABLO	CANYON P	OWER PLANT	UNIT NO(S)	1 AND 2		NUMBER REVISION DATE	EP RB-16:A 0 7/14/84
TITLE	SENTRY INI (<u>NOT</u> II	POST-ACCIN TIAL ACTION NTENDED TO	DENT SAMP NS DURING MEET THE	AN EMERGENCY	LIMIT)	PAGE	15 OF 24
		b)	Release ISOLATE	the TEST but SAMPLE FLASK	ton and verify window goes o	that the ff.	[]
		c)	Push th	e ACK button	and verify:		
			(1) th	e alarm is si	lenced.		[]
			(2) th	e 3 upper win	dows glow stead	tv.	r 1
		d)	Push th windows	e RESET butto are off.	n and verify th	nat all	[]
	f,	At the P(operated	OST LOCA valve sw	CNT ISOLATION witches should	PANEL all five be CLOSED:	e key	
	g.	At the CA	AP, valve	s should be p	ositioned as fo	ollows:	
		CAP-V-12	(open)				[]
		Adjust ni	itrogen r	egulator unti	1 nitrogen		
		pressure	gauge is	60 ± 2 psig.			[]
		CAP-V-7	(YSI OXY	GEN ANAL.)			[]
		CAP-V-8	(open)				[]
		CAP-V-6	(OXYGEN	CALIB. SOL'N)			[]
		CAP-V-5	(CLOSED)				[]
		CAP-V-2	(open)				[]
		CAP-V-1	(open)				[]
		CAP-V-29	(12 0'c]	ock)			[]
		CAP-V-28	(12 0'c]	ock)			[]
		CAP-V-27	(12 o'c]	ock)			[]
		CAP-V-9	(closed)				[]
		CAP-V-15	(closed)				[]
		CAP-V-16	(closed)				[]
		CAP-V-26	(closed)				[]
		CAP-V-30	(9 0'clo	ck)			[]
		CAP-V-25	(closed)				[]
		CAP-V-20	(closed				[]
		CAP-V-19	(closed)				[]
		CAP-V-18	(closed)				[]
		CAP-V-11	(open)				[]
		EVT					

DIABLO	CANYON F	NUMBER EP RB-16:A REVISION O DATE 7/14/84	
TITLE	SENTRY INI (<u>NOT</u> I	POST-ACCIDENT SAMPLING SYSTEM TIAL ACTIONS DURING AN EMERGENCY NTENDED TO MEET THE 3-HOUR TIME LIMIT)	PAGE 16 OF 24
	h.	At the Demin Module of the LSP, valves show be positioned as follows:	Jld
		DM-V-1.1 (closed)	
		DM-V-1.2 (closed)	[]
		DM-V-1.3 (closed)	[]
		DM-V-3 (closed)	[]
		DM-VREL-1.1 (closed)	[]
		DM-VREL-1.2 (closed)	[]
		DM-VREL-1.3 (closed)	[]
	1.	At the Open Grab Sample panel of the LSP, we should be positioned as follows:	valves
		RW-V-6 (closed)	F 1
		DM-V-2.1 (closed)	[]
		DM-V-2.2 (closed)	[]
		DM-V-2.3 (closed)	[]
		RC-V-17 (closed)	[]
		RC-V-6.1 (closed)	[]
		RC-V-6.2 (closed)	[]
		RC-V-5.1 (closed)	[]
		RC-V-5.2 (closed)	[]
	j.	At the RC Module of the LSP, valves should positioned as follows:	be
		RC-V-12 (12 o'clock)	[]
		RC-V-15 (CLOSED)	[]
		RC-V-14 (closed)	[]
		RC-V-13 (9 o'clock)	[]
		RC-V-10 (9 o'clock)	[]
		RC-V-11 (CLOSED)	[]
		RC-DV-2 (9 o'clock)	[]
		RC-VREL-1 (closed)	[]
			이 가지 말 옷을 줄
D	00128	6V I	

DIABLO	CANYON P	NUMBER EP RB-16:A REVISION O			
TITLE	SENTRY INI (<u>NOT</u> I	POST-ACCI TIAL ACTIC NTENDED TO	DATE 7/14/84 PAGE 17 OF 24		
		RC-VREL-	2 (closed)	[]	
		RC-V-3	(closed)	[]	
		RC-V-7	(9 o'clock)	[]	
		RC-V-2	(closed)	[]	
		RC-V-1.1	(closed)	[]	
		RC-V-1.2	(closed)	[]	
		RC-V-1.3	(closed)	[]	
		RC-V-1.4	(closed)	[]	
		RC-V-1.5	(closed)	[]	
		RC-V-4	(closed)	[]	
		RC-V-8.1	(closed)	[]	
		RC-V-8.2	(closed)	[]	
		RC-V-16	(closed)	[]	
		RC-V-9	(CLOSED)	[]	
		RC-V-18	(6 o'clock)	[]	
		RC-V-19	(BYPASS)	[]	
		RC-V-20	(closed)	[]	
		RC-V-21	(closed)	[]	
		RC-DV-1	(BYPASS)	[]	
		RC-22	(TO WASTE)	[]	
	k.	At the R position	W Module of the LSP, valves should I ed as follows:	be	
		RW-V-9	(closed)	[]	
		RW-V-10	(closed)	[]	
		RW-DV-1	(BYPASS)	[]	
		RW-V-8	(BYPASS)	[]	
		RW-V-7	(BYPASS)	[]	
		RW-V-5	(6 o'clock)	[]	
		RW-V-4	(closed)	[]	
		RW-V-3	(closed)	[]	
	00128	I7VI			

DIABLO	CANYON POWER PLANT UNIT NO(S) 1 AND 2 SENTRY POST-ACCIDENT SAMPLING SYSTEM	NUMBER EP RB-16:A REVISION O DATE 7/14/84 PAGE 18 OF 24
TITLE	(NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	
	RW-V-1.1 (12 o'clock)	[]
	RW-V-1.2 (12 o'clock)	[]
	RW-V-1.3 (12 o'clock)	[]
	RW-V-2.1 (6 o'clock)	[]
	RW-V-2.2 (6 o'clock)	. []
	RW-V-2.3 (6 o'clock)	[]
	RW-V-1.4 through RW-V-1.10 (closed)	[]
	RW-V-2.4 through RW-V-2.10 (closed)	[]
	1. At the PROCESS CONTROL PANEL (PCP)	
	NOTE: Notify the Control Room when an changed.	ny valve alignments are
	 Position or check the position of switches for valves: 	f the following
	FCV-9351A (CLOSE)	[]
	FCV-9351B (CLOSE)	[]
	FCV-9350B (CLOSE)	[]
	FCV-9350A (CLOSE)	[]
	FCV-9353A (CLOSE)	[]
	FCV-9353B (CLOSE)	[]
	FCV-692 (CLOSE)	[]
	FCV-693 (CLOSE)	[]
	FCV-694 (CLOSE)	[]
	FCV-1413 (CLOSE)	[]
	FCV-1416 (CLOSE)	[]
	FCV-1417 (CLOSE)	[]
	FCV-1418 (CLOSE)	[]
	FCV-1419 (CLOSE)	[]
	FCV-1412 (CLOSE)	[]
	FCV-1410 (CLOSE)	[]
	FCV-1411 (CLOSE)	[]
	FCV-1414 (CLOSE)	[]
D	DC0128 18VI	

DIABLO	CANYON POWE	NUMBER EP RB-16:A REVISION O DATE 7/14/84			
TITLE	SENTRY POST INITIAL (<u>NOT</u> INTEND	-ACCIDENT SAM ACTIONS DURIN DED TO MEET TH	PAGE 19 OF 24		
		FCV-1415 (CLOSE)		[]
		FCV-1420 (CLOSE)		1]
		FCV-1421 (CLOSE)		[]
		FCV-1422 (CLOSE)		[]
		FCV-1423 (CLOSE)		[]
		FCV-1424 (CLOSE)		[]
		FCV-1425 (CLOSE)		[]
		FCV-624 (CLOSE)		[]
		FCV-1428 (POST LOCA SAMP	LING)	[]
	2)	Position sw TRANSFER PU	itches for POS MPS 1 and 2 to	T LOCA COLLECTION the STOP posit	ON TANK ion. []
	3)	Sample Sour	ce Valves		
		a) Determ will h	ine which samp ave to be open	le source isolated from the list	tion valves t below:
		SAMPLE SOUR	CE	CONTAINMENT IS	SOLATION VALVES
		Hot Legs Log Pressurizer Pressurizer RHR Pumps D Volume Cont	ops 1 and 4 Steam Space Liquid Space ischarge rol Tank	FCV-9356A and FCV-9354A and FCV-9355A and N/A N/A	FCV-9356B FCV-9354B FCV-9355B
		b) Call the open /li>	ne Control Room ne appropriate	m and have operation of the second seco	ations block plation valves.
		If samp contro pumps, 500 and valves 697. (are key Sentry	oling the reac room to turn then open con 501 for one r FCV 500 and 50 Containment iso r operated valu Room at the PO	tor cavity sump, on the reactor tainment isolat minute. Close f D1 and open valvo plation valves f ve switches cont DST LOCA CNT ISO	, notify the cavity sump isolation ves FCV 696 and FCV 696 and 697 trolled in the DLATION PANEL.
		c) Open th valve ((RSIV) the PCF	ne correspondin (RPIV), remote , and remote f (see attachme	ng remote plant source isolatio lush isolation v ent 1 for proper	isolation on valve valve (RFIV) at valve).
D	C0128 19VI				

DIABLO CA	ANYON PO	OWER PLAN		NO(S) 1	AND 2	NUMBER REVISION DATE PAGE	EP RB-16:A 0 7/14/84 20 OF 24
5 TITLE - (SENTRY POST-ACCIDENT SAMPLING SYSTEM INITIAL ACTIONS DURING AN EMERGENCY (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)						
		d)	Allo minu RB-1	w remote sa tes before 5:II).	mpling purging purging sample	for at least 20 lines at panel	(EP
		4) At t	the PCI	p			
		a)	Push	the TEST b	outton and verif	y:	
			(1)	the alarm	sounds		[]
			(2)	all labele	d windows flash		[]
		b)	Push	the ACK bu	tton and verify	:	
			(1)	the alarm	is silenced		[]
			(2)	all labele	d windows glow	steady	[]
		c)	Push all v	the RESET windows are	button and veri off.	fy that	[]
9.	Monit	or Startu	up and	0 ₂ Calibra	tion Tank Recir	culation (CAP)	
	NOTE:	This se section	ection n.	may be unn	ecessary. If s	o, skip to the r	next
	a.	Dissolved	d 0 ₂ Ca	alibration	Tank Recirculat	ion	
		1) If o proc	calibra	ation has b step b.	een performed w	ithin one week,	[]
		2) Obse tank If w CAP-	erve th k CAP-(water n -V-18,	hat the lev CAL-4 is ab nust be add open CAP-V	el in the oxyge out 1" below to ed to the tank, -11 and CAP-V-2	n calibration p of sightglass. check closed 4 and fill the	
		tank	k. Cla	ose CAP-V-2	4.		[]
		3) Oper	n fully	CAP-V-17.			[]
		4) Turn Indi	n the (icator	AP and CMP	YSTEM pump to 0 the pump shoul	N position. d light on	[]

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DIABLO C	NUMBER EP REVISION NUMBER EP REVISION SENTRY POST-ACCIDENT SAMPLING SENTRY POST-ACCIDENT </th <th>EP RB-16:A 0 7/14/84 21 OF 24</th>						EP RB-16:A 0 7/14/84 21 OF 24
		5)	Recirculate	the water f	or at least 1	hour.	[]
					Time on		
		6)	Continue to calibration	recirculate is performe	until the act d.	ual	[]
	b.	pH M	onitor (CMP)				
		NOTE	: This sectionskip to the	on may be u e next sect	nnecessary. I ion.	if so,	
		1)	Make sure the pH7 and pH4	e pH buffer or 10 buffe	tanks are ove rs at the CAP.	er half full	with []
			NOTE: To fi on to appro- pipe	ll vent tan p of sight priate buff cap and the	k pressure, re glass and fill er. Be sure t n repressurize	move pipe ca with to install tank.	p
		2)	Place intern position.	al S-1 togg	le switch to C	N (up)	[]
		3)	Switch S-3 to	o the OFF p	osition.		[]
		4)	With a small control for and then res	screwdrive full downwa et to a rea	r, adjust R-3 rd and upward ding of 7.0.	standardize deflection	[]
		5)	Switch S-3 t	o the ON po	sition.		[]
	с.	Cond	uctivity Moni	tor (CMP)			
		NOTE	This section to the nex	on may be u t section.	nnecessary. I	f so, skip	
		1)	Observe that the selector	the meter switch is	reading is on on ZERO.	zero when	[]

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DIABLO	CANYON P	DWER PLANT UNIT NO(S) 1 AND 2 REDA	IMBER EP RB-16: VISION 0 NTE 7/14/84 AGE 22 0F 2
	INI (<u>NOT</u> I	TIAL ACTIONS DURING AN EMERGENCY NTENDED TO MEET THE 3-HOUR TIME LIMIT)	
		 Turn the selector switch to CHECK. The meter indicator should move to CHECK on the meter scale. 	r []
		NOTE: If it does not move to CHECK, consult Site Emergency Coordinator for direct	the
		 Switch the selector switch to MEASURE. The monitor is now ready for operation. 	[]
		4) Energize for 30 minutes. Time on _	
	d.	YSI Dissolved Oxygen Analyzer (CMP)	
		NOTE: This section may be unnecessary. If so, skip to next section.	
		1) Turn POWER switch to ON.	[]
		2) Turn 02 FILTER to OFF.	[]
		3) Turn 02 RANGE to 0-20 ppm.	[]
		4) Turn PEN INPUT to ZERO.	[]
		5) Turn CHART SPEED to RAPID.	[]
		6) Adjust the PEN ZERO control until the pen traces a line on the 0-20 chart scale at 0.	[]
		7) Turn CHART SPEED to 10.	[]
		8) Turn PEN INPUT to -02.	[]
		9) Energize for 30 minutes. Time on	
	е.	Ion Chromatograph Startup	
		NOTE: This section may be unnecessary. If so, skip to next section.	

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NTRY POST- INITIAL A OT INTENDE 1) 2) 3)	ACCIDENT SAMPLING SYSTEM ACCIDENT SAMPLING AN EMERGENCY D TO MEET THE 3-HOUR TIME LIMIT) Verify that the level of chloride calibration s (2000 ppm B as boric acid and 1 ppm chloride) i least half full in CAL-3. Verify that air bubbles are <u>not</u> visible in the glass. <u>NOTE</u> : If air bubbles are present, check the pur vent; venting is required when eluent con are filled.	tandarc s at [] sight [] mps and ntainer	3 OF 24
1) 2) 3)	<pre>Verify that the level of chloride calibration s (2000 ppm B as boric acid and 1 ppm chloride) i least half full in CAL-3. Verify that air bubbles are <u>not</u> visible in the glass. <u>NOTE</u>: If air bubbles are present, check the pur vent; venting is required when eluent con are filled.</pre>	tandaro s at [] sight [] mps ano ntainer	d 1
2) 3)	<pre>Verify that air bubbles are not visible in the glass. <u>NOTE</u>: If air bubbles are present, check the pur vent; venting is required when eluent con are filled.</pre>	sight [] mps and ntainer	f
3)	NOTE: If air bubbles are present, check the pur vent; venting is required when eluent con are filled.	mps and ntainer	1
3)			s
	Verify that the following reagents are available	e.	
	0.0015 <u>M</u> Sodium Bicarbonate (NaHCO ₃)	[]	
	0.006 M Sodium Carbonate (Na ₂ CO ₃ . 10H ₂ 0)	[]	
	1 <u>N</u> Sulfuric Acid (H ₂ SO ₄)	[]	
	Deionized Water Rinse	[]	
4)	If an, of the reagents listed in step 3 is not available or has not been prepared within the last 30 days, refer to Attachment 2 for details of reagent preparation.	[]	
5)	Place the POWER and AIR switches to ON position.	. []	
6)	Place LOAD/INJECT switch in the LOAD position.	[]	
7)	Place the E-2 switch in the UP position.	[]	
8)	Place the SEPARATOR switch in the SEP-1 position	n.[]	
9)	Place the SUPPRESSOR switch in the SUP-1/RGN-2 position.	[]	
NOTE	: The following are performed at the conductivit meter on the CAP:	ty	
10)	Set MODE switch to ZERO and verify needle points to 0.	5 C D	
	NOTE: If not at ZERO, adjust to ZERO with the s below the meter face.	screw	
	5) 6) 7) 8) 9) <u>NOTE</u> 10)	 of reagent preparation. 5) Place the POWER and AIR switches to ON position. 6) Place LOAD/INJECT switch in the LOAD position. 7) Place the E-2 switch in the UP position. 8) Place the SEPARATOR switch in the SEP-1 position. 9) Place the SUPPRESSOR switch in the SUP-1/RGN-2 position. NOTE: The following are performed at the conductivity meter on the CAP: 10) Set MODE switch to ZERO and verify needle point: to O. NOTE: If not at ZERO, adjust to ZERO with the superlow the meter face. 	 of reagent preparation. [] 5) Place the POWER and AIR switches to ON position. [] 6) Place LOAD/INJECT switch in the LOAD position. [] 7) Place the E-2 switch in the UP position. [] 8) Place the SEPARATOR switch in the SEP-1 position. [] 9) Place the SUPPRESSOR switch in the SUP-1/RGN-2 position. [] NOTE: The following are performed at the conductivity meter on the CAP: 10) Set MODE switch to ZERO and verify needle points to 0. [] NOTE: If not at ZERO, adjust to ZERO with the screw below the meter face.

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DIABLO CANYON POWER P	PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-16:A REVISION O DATE 7/14/84
SENTRY POST- TITLE INITIAL A (NOT INTENDE	ACCIDENT SAMPLING SYSTEM CTIONS DURING AN EMERGENCY D TO MEET THE 3-HOUR TIME LIMIT)	PAGE 24 OF 24
11)	Set MODE switch to CAL and verify needle full scale.	swings []
	NOTE: If adjustment is necessary, adjus screw at the top of the circuit b labeled METER).	t using the oard (the one
12)	Set MODE switch to LIN.	[]
13)	Set the μ MHO FULL SCALE switch to 30.	[]
14)	Check if eluent pump setting is 40 perce	nt. []
15)	Turn the eluent pump switch to ON positi	on. []
16)	Turn GAUGE switch to ON position. Norma operating pressure is 200 psig.	1 []
17)	Allow system to warm up and stabilize for 30 minutes.	r
	Time on	
10. Sampling	may now commence.	
REFERENCES		
 Sentry Eq and Maint 	uipment Corp. High Radiation Sampling Systematics Manual.	tems Operations
ATTACHMENTS		
1. Valves for	r Obtaining Samples	

2. Reagent Preparation

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PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

TITLE: VALVES FOR UBTAINING SAMPLES

ATTACHMENT 1

SAMPLE SOURCE	REMOTE PLANT ISOLATION VALVE (RPIV)	REMOTE SOURCE ISOLATION VALVE (RSIV)	REMOVE FLUSH ISOLATION VALVE (RFIV)	LSP SAMPLE SOURCE VALVE (SSV)
RC Hot Leg 1	FCV-9351 A	FCV-692	FCV-1416	RC-V-1.1
RC Hot Leg 4	FCV-9351 B	FCV-692	FCV-1416	RC-V-1.1
PZR Liquid	FCV-9350 B	FCV-693	FCV-1417	RC-V-1.2
PZR Steam	FCV-9350 A	FCV-694	FCV-1418	RC-V-1.3
RHR Pump 1-1 Discharge	FCV-9353 A	FCV-1413	FCV-1419	RC-V-1.4
RHR Pump 1-2 Discharge	FCV-9353 A	FCV-1413	FCV-1419	RC-V-1.4
VCT Liquid	N/A	FCV-1412	FCV-1420	RC-V-1.5
Reactor Cavity Sump	FCV-696-Inside CNT FCV-697-Outside CN	N/A T	FCV-1423	RC-V1
Equipment Drain RCVR	N/A	FCV-1414	FCV-1424	RW-V-2.3
Floor Drain RCVR	N/A	FCV-1415	FCV-1425	RW-V-2.2

PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLAN UNIT NOS. 1 AND 2

Page 1 of 1

TITLE: REAGENT PREPARATION

ATTACHMENT 2

- NOTE: Reagents must have a shelf life of 30 days. Reagents must be made using demin water with a conductance of less than 1 µmho.
- 1. 0.0015 M Sodium Bicarbonate (NaHCO3)

Dissolve 2.5200g sodium bicarbonate in 20 liters demin water. Transfer the solution of a 4 liter collapsible container provided in the ion chromatograph. Remove excess air from the container by opening the top valve and squeezing the container until overflow occurs. Label the container including initials and date. Connect to line E-2 in the reagent storage facility of the ion chromatograph. Open the container valve and vent pump inlet lines.

2. 0.006 <u>M</u> Sodium Carbonate (Na₂CO₃ . 10H₂ 0)

Dissolve 6.87 grams of Sodium Carbonate in 4 liters of demin water. Transfer the solution to a 4 liter collapsable container, remove excess air, and label container with initials and date. Connect to line E-1 in the reagent storage facility of the ion chromatograph. Open the container valve and vent pump inlet lines.

3. 1<u>N</u> H₂ SO₄

Add with stirring 120 ml of concentrated sulfuric acid to 4 liters of demin water and cool. Transfer the solution of a 4 liter collapsable container, remove excess air, and label container with initials and date. Connect it to the line REGEN SYSTEM-1. Open the container valve and vent pump inlet lines.

4. Demineralized Water Rinse

Fill a four (4) liter collapsable container with demin water. Remove excess air from the bottle and label. Connect it to the water line in the reagent storage facility. Open the container valve and vent pump inlet lines.

	DEPA DIABL TITLE	RTMEN O CANY EM SE DI (M	Pacific G	AR PLAN PLANT U PERATI -ACCID UID SA ED TO	d Electric C IT OPERATION UNIT NO(S) ING PROCEDU DENT SAMPLI IMPLING FROM MEET THE 3	ompany is 1 AND 2 RE NG SYSTEM M REACTOR HOUR TIME	NUMBER REVISION DATE PAGE COOLANT LIMIT)	EP RE-16:B1 O 7/18/84 1 OF 8
	APPR	OVED		<u>x c</u>	PLANT M	ANAGER	DATE	-
DIS	CUSSI	ON				EN		T TO
The obt flu and	purp ain a sh of syste	ose of dilut the m em wil	this pro- ed liquid odules wi l be retur	cedure sample 11 be rned to	is to deta e from the done after o initial l	the ster reactor co the sample lineup stat	eps required to colant. A comp has been proc us.	lete essed
PRE	REQUI	SITES						
1.	Syst EP 1	tem wa RB-16:	s initial A.	ly line	ed up as de	escribed in	procedure	
2.	Ver	ify th	at the fo	llowing	g annunciat	or windows	are off on th	e PCP:
	a.	REAC	TOR COOLAN	T SAME	PLE COOLING	WATER LOW	FLOW	
	b.	REAC	TOR COOLAN	NT SAMP	PLE COOLING	WATER LOW	PRESS	
	с.	REAC	TOR COOLAN	T SAMP	PLE COOLING	WATER HIG	H TEMP	
	d.	REAC	TOR COOLAN	T PURG	SE HIGH TEM	P		
	e.	REAC	TOR COOLAN	T SAMP	PLE WATER H	IGH TEMP		
	f.	LIQU	ID SAMPLE	PANEL	HIGH PLENU	M PRESS		
	g.	CHEM	ANALYSIS	PANEL	HIGH PLENU	M PRESS		
3.	The	follow	ving equip	ment m	rust be ava	ilable and	operational:	
	a.	Meter	-long rea	ch rod	1			
	ь.	Hand	operated	vacuum	pump			

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ABLO	SENT DILU (NOT	ON POWER PLANT UNIT NO(S) 1 AND 2 RY POST-ACCIDENT SAMPLING SYSTEM TED LIQUID SAMPLING FROM REACTOR COOLANT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER EP RB-16:B1 REVISION O DATE 7/18/84 PAGE 2 OF 8		
		c. Sample cart/cask with the 60ml lift rod asse	mbly.		
		d. A pre-labeled 60 ml sample bottle with a new	septum.		
		NOTE: The label should have the sample source, d time of the sample, and the initials of the the sample. (From this point estimate 20 m	ate, estimated e person taking minutes)		
	4.	The gas chromatograph must be in a standby mode w calibration.	ith a valid		
		Assign one LSP operator to EP RB-16:D to prepare	the GC.		
	PRECAUTIONS				
	1.	See EP RB-16:A for details.			
	2.	This sampling involves processing of water that w radioactive. Precautions should be taken to preve or ingestion.	ill be highly ent skin contact		
	3.	Time in a radiation field should be limited to the perform the required operations. During purge and it may not be necessary to stand near the panels a consideration should be given to moving to a low o	at necessary to d flush period, and dose area.		
	4.	A dose rate instrument should be on and periodic r suggested during purge and sampling exercises.	monitoring is		
	5.	The LSP operator must verify that the gas chromator to receive a gas sample before opening valve RC-V- RC-V-15 must be closed after filling all G.C. samp prior to performing diluted gas sampling and final operations.	ograph is ready -15. Valve ble loops and I flushing		
	PROCE	DURE			
	1.	Perform all actions specified in EP RB-16:A.			
	2.	Verify RC-DV-1 is turned to BYPASS. Fill reservoi RC-R-1 with demin water:	ir		
		a. Open RC-V-20 and RC-V-21	[]		

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ITLE (NO	TED LIQUID SAMPLING FROM REACTOR COOLANT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	7/18/84 3 OF 8
	b. Adjust reservoir RC-R-1 until the water level in graduated cylinder RC-C-1 is over 100 mls.	[]
	c. Close RC-V-21 and RC-V-20	[]
3.	Verify that the following valves are closed:	
	RC-V-1.1 through 1.5 [] RC-V-4 []	
4.	Insert the needle of the hand operated vacuum pump into the septum of the prelabeled 60 ml sample bottle:	[]
	a. Evacuate to the maximum vacuum achievable with the hand pump. The vacuum must be at least 15" of Hg.	[]
	b. Keep the pump connected to the bottle for 3 minutes to assure that the bottle retains the vacuum.	C 3
5.	Turn on the switch to light the diluted bottle fill station.	[]
6.	Remove the bottle from the vacuum pump and place bottle on the cart/cask assembly cavity piston.	[]
	a. Turn the direction valve for the hydraulic piston to the down position and lower the bottle into the cask cavity.	[]
	b. Close and open the cask to verify that the cover is working properly.	[]
	c. Position the cart/cask under the diluted reactor coolant fill station needle and set the brake.	[]
	d. Turn the direction valve for the hydraulic piston to the up position and raise the bottle onto the needle.	[]

DIABLO C SI D TITLE	ANYON POWER PLANT UNIT NO(S) 1 AND 2 INTRY POST-ACCIDENT SAMPLING SYSTEM LUTED LIQUID SAMPLING FROM REACTOR COOLANT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	EP RB-16:B1 0 7/18/84 4 OF 8
7.	At the PCP verify that the sample cooler water flow, temperature, and pressure annunciator lights are off.	[]
8.	Open the following valves:	
•	RC-V-9 RC-V-8.2 RC-V-10	
9.	Reactor Coolant Sample Line Purge	
	a. Open RC-V-8.1.	[]
	b. Open RC-SV-1 and RC-SV-2 by turning breaker #10 to ON.	[]
	NOTE: The sample source valves are labeled RC-V-1.1 through RC-V-1.5. Throughout this procedure, the form RC-V-1.X will be used to indicate the source valve to be operated. The sample source used for sampling will have been given at a briefing by the Site Chem and Rad Protection Coordinator.	
	NOTE: Upon implementation of the next step, sample will be flowing into the back of the LSP. The meter-long reach rod should be used to operate valves and a dose rate survey should be done to monitor radiation levels.	
	c. Close remote flush isolation valve (RFIV).	[]
	d. Open the sample source valve RC-V-1.X (see Attachment 1 for proper valve).	[]
	e. Open RC-V-3.	[]
	f. Slowly open RC-VREL-1 until RC-FI-1 indicates 100% flow. Purge for 5 minutes.	[]
	g. Slowly close RC-VREL-1 until RC-FI-1 indicates 36%. Continue the purge for 1 minute.	[]

DIABL	SEN DILI (NO	NYON I TRY P UTED I INT	POWER PLANT UNIT NO(S) 1 AND 2 NUMBE REVIS OST-ACCIDENT SAMPLING SYSTEM LIQUID SAMPLING FROM REACTOR COOLANT ENDED TO MEET THE 3-HOUR TIME LIMIT)	R EP RB-16:B1 SION 0 7/18/84 5 OF 8
		h.	Close RC-V-3.	[]
	10.	Read	ctor Coolant Sampling	
		a.	Open RC-V-2.	[]
		b.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow. Purge for 3 minutes.	[]
		с.	Close RC-V-8.2	[]
		d.	Close RC-V-8.1	[]
		e.	Turn RC-DV-1 to SAMPLE.	[]
		f.	Close RC-V-1.X.	[]
		g.	Call the control room and have operations close the containment isolation valves opened in Step 12.c. (if applicable).	[]
	11.	Init	ial Flushing	
		â.	At the PCP, perform the following:	
			1) Close the remote source isolation valve.	[]
			2) Close the remote plant isolation valve.	[]
			 Open the remote flush isolation valve (see Attachment 1 for the proper valve). 	[]
		b.	Open in order valves RC-V-7 and RC-V-4	[]
		c.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow. Flush with demin water for 3 minutes.	[]
		d.	Close RC-V-7	[]
		e.	Open RC-V-3.	[]
		f.	Adjust RC-VREL-1 until RC-FI-1 indicates 80-90% flow. Flush with demin water for 1 minutes.	[]
				N. N. Martin and M. C. Martin

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DIABLO	D CAN SEN DIL (<u>NO</u>	YON P TRY P UTED T INT	OWER PLANT UNIT NO(S) 1 AND 2 OST-ACCIDENT SAMPLING SYSTEM LIQUID SAMPLING FROM REACTOR COOLANT ENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER REVISIO DATE PAGE	EI N 0 7, 6	P RB-16:81 /18/84 OF 8
		g.	Close RC-V-3.	-	[]
		h.	Open RC-V-1.X. Flush with demin water	for 5 minutes	. []
		۱.	Close RC-V-1.X.		[]
	12.	Liqu	id Sample Dilution			
		a.	Crack open RC-V-21, and add 23 mls of RC-C-1 to the sample bottle, then clos	water from e RC-V-21.	[]
		b.	Turn the RC-DV-1 to BYPASS.		[]
		c.	Place the direction valve for the hydr piston in the down position and lower into the cask.	aulic the sample	[1
		d.	Close the cask.		[]
	13.	Samp	le Cask/Cart Removal			
		a.	Release brake and remove the cart/cask sample station and place in temporary	from the hold area.	C	J
		b.	Perform a radiation and contamination the cart/cask assembly.	survey on	Ę	1
		с.	Turn off the diluted fill station light	t.	[]
	14.	Fina	l Flushing			
		a.	Verify RC-V-15 is in the CLOSED position	on.	I]
		b.	Turn RC-V-11 <u>counterclockwise</u> to the 6 position.	o'clock	ſ]
		с.	Open the following valves:			
			RC-V-9 [] RC-V-7 [] RC-V-8.1 []			

DIABLO	CANYON P SENTRY P DILUTED (<u>NOT</u> INT	POWER PLANT UNIT NO(S) 1 AND 2 POST-ACCIDENT SAMPLING SYSTEM LIQUID SAMPLING FROM REACTOR COOLANT PAGE ENDED TO MEET THE 3-HOUR TIME LIMIT)	EP FE-16:B1 0 7/18/84 7 OF 8
	d.	Adjust RC-VREL-2 until RC-FI_2 indicates 100% flow. Flush with demin water for 1 minute.	[]
	e.	Open RC-V-8.2.	[]
	f,	Close RC-V-9 and RC-V-7.	[]
	g.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow. Flush with demin water for 3 minutes.	[]
	h.	Close RC-V-8.1.	[]
	i.	Turn RC-V-11 counterclockwise to the 3 o'clock position.	[]
	j.	Open RC-V-9.	[]
	k.	Pull open RC-VREL-2.	[]
		 When there is a sharp increase in pressure indicated on RC-G-3, release RC-VREL-2. 	[]
		2) Adjust RC-VREL-2 until RC-G-3 indicates 20 psig.	[]
		3) Flush with argon for 3 minutes.	[]
	1.	Close RC-V-9.	[]
	m.	Open RC-V-10.	[]
	n.	Turn RC-V-11 counterclockwise to the 9 o'clock position and allow RC-EV-1 to vent.	[]
	0.	Close RC-V-10.	[]
	p.	Turn RC-V-11 clockwise to CLOSED.	[]
	q.	Open RC-V-8.1.	[]
	r.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow.	[]
		Flush with demin water for 1 minute.	[]

	s. Close RC-V-2.		[]
	t. Open RC-V-1.X and flush with demin water for 5 minutes.		[]
	u. Close RC-V-1.X.		[]
	v. Terminate flushing by closing the following va	lves.	[]
	RC-V-8.1 []] RC-V-8.2 []] RC-VREL-1 []] RC-VREL-2 []] RC-V-4 []]		
15.	At the FCP, close the remote flush isolation valve.		[]
16.	At breaker panel PYNM11, place breaker #10 to the O position.	FF	[]
17.	Close sample cooler water.		[]
18.	Call the Site Chem and Rad Protection Coordinator and inform him that the diluted reactor coolant sample is ready for transfer/analysis.		[]
	Using procedure EP RB-16:E, aliquot and analyze the diluted liquid sample for boron.		[]
20.	Process the data according to procedure EP RB-16:F.		[]
REFER	RENCES		
1.	Sentry Equipment Corp. High Radiation Sampling Syste and Maintenance Manual.	em Operat	ting
ATTA	CHMENTS		
1.	Valves for Obtaining Samples from Reactor Coolant.		

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PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

TITLE: VALVES FOR OBTAINING SAMPLES FROM REACTOR COOLANT

ATTACHMENT 1

SAMPLE SOURCE	REMOTE PLANT ISOLATION VALVE (RPIV)	REMOTE SOURCE ISOLATION VALVE (RSIV)	REMOVE FLUSH ISOLATION VALVE (RFIV)	LSP SAMPLE SOURCE VALVE (SSV)
RC Hot Leg 1	FCV-9351 A	FCV-692	FCV-1416	RC-V-1.1
RC Hot Leg 4	FCV-9351 B	FCV-692	FCV-1416	RC-V-1.1
PZR Liquid	FCV-9350 B	FCV-693	FCV-1417	RC-V-1.2
PZR Steam	FCV-9350 A	FCV-694	FCV-1418	RC-V-1.3
Discharge	FCV-9353 A	FCV-1413	FCV-1419	RC-V-1.4
RHR Pump 1-2 Discharge	FCV-9353 A	FCV-1413	FCV-1419	RC-V-1.4
VCT Liquid	N/A	FCV-1412	FCV-1420	RC-V-1.5

	DEPAR DIABLO TITLE APPRO	Pacific G	AR PLANT OPER PLANT UNIT NO OPERATING PRO -ACCIDENT SA IQUID SAMPLI DED TO MEET T R. C. PLA	TIC COMPANY ATIONS (S) 1 AND 2 DCEDURE AMPLING SYSTEM ING FROM REACTO THE 3-HOUR TIME ANT MANAGER	REVISION DATE PAGE R COOLANT LIMIT) 7-31-84 DATE	0 7/18/84 1 OF 6
DIS	cussic	IN		EN		
The obtain com	purpo ain ar plete	se of this pro undiluted lig module flushir	cedure is to uid sample o g.	detail the st during accident	eps required to conditions and	
PRE	REQUIS	ITES				
1.	Syst EP F	em was initial B-16:A.	ly lined up	as described i	n procedure	
2.	. Verify that the following annunciator windows are off on the PCP:					
	à.	REACTOR COOLA	NT SAMPLE CO	DOLING WATER LO	W FLOW	
	b.	REACTOR COOLA	NT SAMPLE CO	DOLING WATER LO	W PRESS	
	с.	REACTOR COOLA	INT SAMPLE CO	DOLING WATER HI	GH TEMP	
	d.	REACTOR COOLA	NT PURGE HIG	GH TEMP		
	e.	REACTOR COOLA	INT SAMPLE HI	IGH TEMP		
	f.	LIQUID SAMPLE	PANEL HIGH	PLENUM PRESS		
3.	The	following equi	pment must b	be available an	d operational:	
	a.	Meter-long re	ach rod			
	b.	Needle flush <u>new</u> septum	tool with de	emin water in a	sample bottle	and a
	с.	Sample cart/c	ask with the	e 15 ml lift ro	d assembly	

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DIABL	O CAN	YON P	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-16:B2 REVISION O DATE 7/18/84	
TITLE	SEN UND (NO	TRY PO ILUTEI I INTI	DST-ACCIDENT SAMPLING SYSTEM D LIQUID SAMPLING FROM REACTOR COOLANT ENDED TO MEET THE 3-HOUR TIME LIMIT)	PAGE 2 OF 6	
		d.	A prelabeled 15 ml sample bottle with a new s	eptum	
			 The label should have the sample source, estimated time of sample, and the initia person taking the sample. (from this po- minutes) 	date, Is of the int estimate 19	
	PREC	AUTIC	INS .		
	1.	This radi or i	sampling involves processing of water that wi oactive. Precautions should be taken to preve ngestion.	ll be highly nt skin contact	
	 Time in a radiation field should be limited to that necessary to perform the required operations. During purge and flush periods it may not be necessary to stand near the panels and consideration should be given to moving to a low dose rate area. 				
	3.	A do sugg	se rate instrument should be on and periodic m ested during purge and sampling exercises.	onitoring is	
	PROC	EDURE			
	1.	Turn stat	on the switch to light the undiluted bottle f ion.	ill []	
	2.	Plac	e the bottle on the cart/cask assembly cavity	piston. []	
		a.	Turn the direction valve for the hydraulic pindown position and lower the bottle into the cavity.	ston in the ask	
		b.	Close and open the cask to verify that the comproperly.	ver is working	
		c.	Position the cart/cask under the undiluted rea fill station needles and set the brake.	actor coolant	
		d.	Turn the direction valve for the hydraulic pip position and raise the bottle onto the needles	ston in the up	

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DIABLO	SENT UNDI (NOT	TRY POS	WER PLANT UNIT NO(S) 1 AND 2 ST-ACCIDENT SAMPLING SYSTEM LIQUID SAMPLING FROM REACTOR COOLANT NDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER REVISION DATE PAGE	EP RB-16:B2 0 7/18/84 3 OF 6
	3.	React	tor Coolant Sample Line Purge		
		a.	Open RC-V-8.1.		[]
		b.	Open RC-SV-1 and RC-SV-2 by turning breaker \neq 10 to ON.		[]
		<u>NOTE</u> :	The sample source valves are labeled RC-V-1.1 through RC-V-1.5. Throughout this procedure, the form RC-V-1.X will be used to indicate the source valve to be operated. The sample source used for sampling will have been given at a briefin by the Site Chem and Rad Protection Coordi	g nator.	
		<u>NOTE</u> :	Upon implementation of the next step, samp will be flowing into the back of the LSP. meter-long reach rod should be used to ope valves and a dose rate survey should be do to monitor radiation levels.	le The rate ne	
		с.	Close remote flush isolation valve (RFIV).		[]
		d.	Open the sample source valve RC-V-1.X (see Attachment 1 for proper valve).		[]
		е.	Open RC-V-3.		[]
		t.	Slowly open RC-VREL-1 until RC-FI-1 indicate 100% flow. Purge for 5 minutes.	S	[]
		g.	Slowly close RC-VREL-1 until RC-FI-1 indicat 36%. Continue the purge for 1 minute.	es	[]
		h.	Close RC-V-3.		[]
	4.	Samp	ling		
		a.	Open RC-V-7		[]
		b.	Slowly open RC-VREL-2 until RC-FI-2 indicate Purge for 3 minutes.	s 100% fl	ow. []
		c.	Turn RC-V-19 to SAMPLE.		[]

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DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 NUMBER EP RB-16: REVISION 0 DATE 7/18/84 PAGE 4 OF 6						
TITLE	SEN UND (<u>NO</u>	SENTRY POST-ACCIDENT SAMPLING SYSTEM INDILUTED LIQUID SAMPLING FROM REACTOR COOLANT NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)				
			CAUTION: Do not exceed 20 psig on RC-G-3.			
		d.	Adjust RC-VREL-2 until RC-G-3 indicates 20 psig or indicates 100% flow. Purge for 2 minutes.	RC-FI-2		
		e.	Close RC-V-7	[]		
		f.	Let RC-G-3 return to 0 psig and wait 30 seconds to bottle to depressurize.	allow the		
		9.	Turn RC-V-19 to BYPASS	[]		
		h.	Close RC-V-1.X	[]		
		i.	Call the control room and have operations close the containment isolation valves opened earlier.	e []		
	5.	Samp	ole Cart/Cask Removal			
		a.	Turn the direction valve for the cart/cask hydraul to the down position and slowly lower the bottle i cask.	ic piston nto the []		
		b.	Close the cask. Release brake and remove the cart the sample station and away from the LSP.	/cask from []		
		c.	Install and secure the auxiliary shield.	[]		
		d.	Install and secure the needle flush tool onto the reactor coolant fill station needles.	undiluted []		
	6.	Init	ial Flushing			
		a.	At the PCP, perform the following:			
			1) Close the remote source isolation valve.	[]		
			2) Close the remote plant isolation valve.	[]		
			3) Open the remote flush isolation valve (see Attachment 1 for proper valve.)	[]		
		b.	Open RC-V-7 and RC-V-4.	[]		

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DIABLO	CANYON	POWER PLANT UNIT NO(S) 1 AND 2 NUMBE REVIS DATE PAGE	ER EP RB-16:8 SION 0 7/18/84 5 OF 6
TITLE	UNDILUT	TED LIQUID SAMPLING FROM REACTOR COOLANT TENDED TO MEET THE 3-HOUR TIME LIMIT)	
	с.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow Flush with demin water for 3 minutes.	«. []
	d.	Close RC-V-7.	[]
	е.	Open RC+V-3.	[]
	f.	Adjust RC-VREL-1 until RC-FI-1 indicates 80-90% flow. Flush with demin water for 1 minute.	[]
	g.	Close RC-V-3.	[]
	h.	Open RC-V-1.X and flush with demin water for 5 min	nutes. []
	i.	Close RC-V-1.X.	[]
	7. Fi	nal Flushing	
	a.	Open RC-V-8.1 and RC-V-8.2.	[]
	b.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow Flush with demin water for 1 minute.	<i>«</i> . []
	с.	Turn RC-V-19 to SAMPLE.	[]
		CAUTION: Do not exceed 20 psig on RC-G-3.	
	d.	Adjust RC-VREL-2 until RC-G-3 indicates 20 psig of indicates 100% flow. Flush with demin water for 2 minutes.	r RC-FI-2 []
	е.	Close RC-V-2	[]
	f.	Let RC-G-3 return to 0 psig and wait 30 seconds to bottle to depressurize.	o allow []
	g.	Turn RC-V-19 to BYPASS	[]
	h.	Terminate flushing by closing the following valves	s:
		RC-V-8.2 [] RC-V-8.1 [] RC-V-4 [] RC-VREL-1 []	

DIABLO	DIABLO CANYON POWER PLANT UNIT * D(S) 1 AND 2 SENTRY POST-ACCIDENT SAMPLING SYSTEM TITLE UNDILUTED LIQUID SAMPLING FROM REACTOR COOLANT (NOT INTENDED TO MEET THE 3-HOUR 1 IME LIMIT)					
	8.	Turn off the undiluted fill station light.	[]			
	9.	[]				
	10.	. []				
	11.	At breaker panel PYNM11, place BKR #10 to the OFF posi	tion. []			
	12.	Perform a radiation and contamination survey on the ca assembly. Handlethe sample according to procedure EP RB-16:J.	rt/cask []			
	1.	Operating				
	ATTA	CHMENTS				
	,	Values for Obsciptor for 1 of a second				

1. Valves for Obtaining Samples from Reactor Coolant.

PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

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1.50

TITLE: VALVES FOR OBTAINING SAMPLES FROM REACTOR COOLANT

ATTACHMENT 1

SAMPLE SOURCE	REMOTE PLANT ISOLATION VALVE (RPIV)	REMOTE SOURCE ISOLATION VALVE (RSIV)	REMOTE FLUSH ISOLATION VALVE (RFIV)	LSP SAMPLE SOURCE VALVE (SSV)
RC Hot Leg 1	9351 A	FCV-692	FCV-1416	RC-V-1.1
RC Hot leg 4	9351 B	FCV-692	FCV-1416	RC-V-1.1
PZR Liquid	9350 B	FCV-693	FCV-1417	RC-V-1.2
PZR Steam	9350 A	FCV-694	FCV-1418	RC-V-1.3
RHR Pump 1-1				
Discharge	9353 A	FCV-1413	FCV-1419	RC-V-1.4
RHR Pump 1-2				
Discharge	9353 B	FCV-1413	FCV-1419	RC-V-1.4
VCT Liquid		FCV-1412	FCV-1420	RC-V-1.5

PG		Pacific Gas and	Electric Company OPERATIONS	NUMBER REVISION DATE	EP RB-16:B3 0 7/19/84
U		CANYON POWER PLANT UP EMERGENCY OPERATIN SENTRY POST-ACCIDE REACTOR COOLANT (NOT INTENDED TO M ED	NIT NO(S) 1 AND 2 G PROCEDURE NT SAMPLING SYSTEM STRIPPED GAS SAMPLING EET THE 3-HOUR TIME LIN MANDAL PLANT MANAGEB	MIT) <u> 7-31-84</u> DATE	1 01 9
DISC	CUSSION		ENVI		TO
The gas samp proc	purpose from th ple, and cedure r	e of this procedure ne reactor coolant, d route gas to the C requires operations of	is to detail the steps collect a diluted strip AP for hydrogen analys at the LSP, CAP and CM	required to s oped gas isoto is. This P panels.	trip pic
PREF	REQUISIT	ES			
1.	System 16:A.	n was initially line	d up as described in p	rocedure EP RB	
2.	Verify	that the following	annunciator windows a	re <u>off</u> on the	PCP:
	a. R	REACTOR COOLANT SAMPI	LE COOLING WATER LOW FI	LOW	
	b. R	REACTOR COOLANT SAMPI	LE COOLING WATER LOW P	RESS	
	c. R	EACTOR COOLANT SAMPL	LE COOLING WATER HIGH	TEMP	
	d. R	REACTOR COOLANT PURG	E HIGH TEMP		
	e. R	EACTOR COOLANT SAMPL	LE HIGH TEMP		
	f. L	IQUID SAMPLE PANEL	HIGH PLENUM PRESS		
	g. C	HEM ANALYSIS PANEL	HIGH PLENUM PRESS		
3.	The fo	llowing equipment mu	ust be available and op	perational:	
	a. M	leter-long reach rod			
	b. G	as bottle griptong			
	с. н	and operated Vacuum	Pump		
	d. A	pre-labeled 14cc ga nstalled	as sample bottle with a	a new septum	

DIABLO	CAN	YON POWER PLANT UNIT NOIST 1 AND 2	NUMBER EP RB-16:B3 REVISION 0 DATE 7/19/84			
TITLE	E SENTRY POST-ACCIDENT SAMPLING SYSTEM REACTOR COOLANT STRIPPED GAS SAMPLING (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)					
		NULE: The label should have the sample source, datime of sample, and the initials of person (from this point estimate 20 minutes).	ate, estimated taking sample.			
	 The gas chromatograph must be in a standby mode with a valid calibration. 					
		Assign one LSP operator to EP RB-16:D to prepare t	the G.C.			
	PREC	AUTIONS				
	1.	See EP RP-16 for details.				
	 This sampling involves processing of water that will be highly radioactive. Precautions should be taken to prevent skin contact or ingestion. 					
	3. Time in a radiation field should be limited to that necessary to perform the required operations. During purge and flush periods, it may not be necessary to stand near the panels and consideration should be given to moving to a low dose area.					
	4.	A dose rate instrument should be on and periodic m suggested during purge and sampling exercises.	onitoring is			
	5. The LSP operator must verify that the gas chromatograph is ready to receive a gas sample before opening valve RC-V-15. Valve RC-V-15 must be closed after filling all G.C. sample loops and prior to performing diluted gas sampling and final flushing operations.					
	PROCE	EDURE				
	1.	Perform all actions specified in EP RB-16:A.				
	2.	Install and secure the needle flush tool at the uncoolant needles of the RC module.	diluted reactor]			
	3.	Open RC-SV-1 and RC-SV-2 by placing BKR #10 to the breaker panel PYNM11.	ON position at]			
	3.	Open the following valves:				
		RC-V-9 RC-V-8.2 RC-V-10]			

DIABLO	SENT	TRY POR PO	OWER PL	LANT UNIT CIDENT SJ LANT STR TO MEET	NO(S) AMPLING IPPED GA THE 3-HO	1 AND SYSTEM S SAMPLI UR TIME	2 NG LIMIT)		NUMBER REVISIO DATE PAGE	EP RB-16:B3 N O 7/19/84 3 OF 9
	4.	Dryi	ng Exp	pansion \	Vessel					
		CAUTION: Adhere to directions for clockwise and counterclockwise movement of valves.							ockwise	
		а.	Turn	RC-V-11	clockwi	se to th	ne 3 o'clo	ock posit	ion.	[]
		b.	Pull press	open RC- sure ind	-VREL-2. icated o	When to n RC-G-3	there is a , release	sharp i RC-VREL	ncrease i -2.	n []
		с.	Adjus 20 ps	st RC-VRI sig. Dry	EL-2 unt y RC-EV-	il RC-G- 1 with a	3 indicat	tes appro a 1 minu	ximately te.	[]
		d.	Turn permi	RC-V-11 it RC-EV-	counter -1 to ve	clockwis nt, ther	e to the close R	9 o'cloc 2-V-9.	k positio	n to []
	5.	Gas	Extrac	ction Ves	ssel and	Line Ev	acuation			
		a.	Insta front	all the p t panel r	prelabel needle w	ed, dilu ith the	ted gas s gas bott	sample bo le gripto	ttle on t ng.	he []
		b.	Open RC-G-	RC-V-13 -2.1 and	and the RC-G-2.	n open F 2 indica	C-V-12 an te a mini	nd evacua imum of 2	te until 2" of Hg.	[]
		c.	Turn evacu RC-G-	RC-DV-2 Jation un -2.1 or a	to the ntil RC- a minimu	6 o'cloc G-2.2 ir m of 22'	k positio dicates f of Hg.	on and co the same [ntinue th reading a]	e s
		d.	Close	e in orde	er:					
			RC-V- RC-V- RC-V-	-13 -10 -12	[]					
			1)	Record minutes	the vacu and ver	um on R(ify vacu	G-2.1. ium is hol	Wait for Iding.	a minimu	m of 2
								RC-G-2.	1" o	of Hg
		e.	Turn	RC-V-11	clockwi	se to th	e CLOSED	position		[]
		f.	Turn	RC-DV-2	to the	9 0'cloo	k positio	on.		[]
		g.	Open appro	RC-V-14 oximately	and ver y 1 psig	ify the	pressure	on RC-G-	2.2 is	[]

DIABLO	CAN	NUMBER EP RB-16:B3 REVISION O DATE 7/19/84		
TITLE	SEN (NO	TRY PO REACTO	OST-ACCIDENT SAMPLING SYSTEM OR COOLANT STRIPPED GAS SAMPLING ENDED TO MEET THE 3-HOUR TIME LIMIT)	FAGE 4 UF 9
	6.	Read	ctor Coolant Sample Line Purge	
		a.	Open RC-V-8.1.	[]
		b.	Open RC-SV-1 and RC-SV-2 by turning breaker #10 to ON.	[]
		NOTE	The sample source valves are labeled RC-V-1.1 through RC-V-1.5. Throughout this procedure, the form RC-V-1.X will be used to indicate the source valve to be operated. The sample source used for sampling will have been given at a briefing by the Site Chem and Rad Protection Coordin	ator.
		NOTE	: Upon implementation of the next step, sample will be flowing into the back of the LSP. meter-long reach rod should be used to oper valves and a dose rate survey should be don to monitor radiation levels.	e The rate ne
		с.	Close remote flush isolation valve (RFIV).	[]
		d.	Open the sample source valve RC-V-1.X (see Attachment 1 for proper valve).	[]
		e.	Open RC-V-3.	[]
		f.	Slowly open RC-VREL-1 until RC-FI-1 indicates 100% flow. Purge for 5 minutes.	[]
		g.	Slowly close RC-VREL-1 until RC-FI-1 indicate 36%. Continue the purge for 1 minute.	s []
		h.	Close RC-V-3.	[]
	7.	Reac	tor Coolant Sampling	
		a.	Open RC-V-2.	[]
		b.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow. Purge for 3 minutes.	[]
		c.	Close RC-V-8.2	[]

DIABLO	NUMBER EP RB-16:B3 REVISION O DATE 7/19/84			
TITLE	SENT	RY PO EACTO INTE	PAGE 5 OF 9	
		d.	Close RC-V-8.1	[]
		e.	Turn RC-DV-1 to SAMPLE.	[]
		f.	Close RC-V-1.X.	[]
		g.	Call the control room and have operations close the containment isolation valves opened earlie	e r. []
	8.	Init	ial Flushing	
		a.	At the PCP, perform the following:	
			1) Close the remote source isolation valve.	[]
			2) Close the remote plant isolation valve.	[]
			 Open the remote flush isolation valve (see Attachment 1 for the proper valve). 	e []
		b.	Open in order valves RC-V-7 and RC-V-4	[]
		c.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow. Flush with demin water for 3 minutes.	[]
		d.	Close RC-V-7	[]
		e.	Open RC-V-3.	[]
		f.	Adjust RC-VREL-1 until RC-FI-1 indicates 80-90 flow. Flush with demin water for 1 minutes.	۶ ۲
		g.	Close RC-V-3.	[]
		h.	Open RC-V-1.X. Flush with demin water for 5 m	inutes. []
		i.	Close RC-V-1.X.	[]
	9.	Gas	Stripping Operation	
		a.	Open RC-V-9, wait approximately 5 seconds, and close RC-V-9.	[]
		b.	Open RC-V-16.	[]
		c.	Snap open RC-V-9 and wait for 1 minute.	[]

DIABLO	SENT	NUMBER EP RB-16:B3 REVISION O DATE 7/19/84 PAGE 6 OF 9		
	(<u>NOT</u>	INTE	NDED TO MEET THE 3-HOUR TIME LIMIT)	
	1	d.	Close RC-V-16 and then close RC-V-9.	[]
		e.	Turn RC-V-11 <u>counterclockwise</u> to the 9 o'cloc position. The pressure reading is normally 1 8 and 10 psig. Record the reading on RC-G-2.	ck between .1
			RC	-G-2.1 psig
		NOTE	: The sample is now ready for analysis in the Chromatograph.	e Gas
		NOTE	: The GC operator should be at step 4.f. of E	EP RB-16:D.
		f.	Stop here and analyze the sample according to EP RB-15:IV. Direct the G.C. operator to ali RC-V-5 to "LSP to GAS CHROMAT".	o ign []
		NOTE	: Do not proceed to the next step until the G operator directs this operation.	G.C.
	10.	Dilu	ted Gas Sampling	
		a.	Turn RC-DV-2 to the 6 o'clock position and wa until the pressure on RC-G-2.2 returns to 1 p	ait psig. []
		b.	Turn RC-DV-2 to the 9 o'clock position.	[]
		c.	ciose RC-V-14.	[]
		d.	Remove the griptong containing the diluted ga sample	es []
		e.	Process offgas sample according to EP RB-16:E	[]

DIABLO	NUMBER EP RB-16:B3 REVISION O DATE 7/19/84			
TITLE	SENT	PAGE 7 OF 9		
	11.	Fina	1 Flushing	
		a.	Verify RC-V-15 is in the CLOSED position.	[]
		b.	Turn RC-V-11 counterclockwise to the 6 o'clock position.	[]
		с.	Open the following valves:	
			RC-V-9 [] RC-V-7 [] RC-V-8.1 []	
		d.	Adjust RC-VREL-2 until RC-FI_2 indicates 100% flow. Flush with demin water for 1 minute.	[]
		e.	Open RC-V-8.2.	[]
		f.	Close RC-V-9 and RC-V-7.	[]
		g.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow. Flosh with demin water for 3 minutes.	[]
		h.	Close RC-V-8.1.	[]
		i.	Turn RC-V-11 <u>counterclockwise</u> to the 3 o'clock position.	[]
		j.	Open RC-V-9.	[]
		k.	Pull open RC-VREL-2.	[]
			 When there is a sharp increase in pressure indicated on RC-G-3, release RC-VREL-2. 	[]
			2) Adjust RC-VREL-2 until RC-G-3 indicates 20	psig. []
			3) Flush with argon for 3 minutes.	[]
		1.	Close RC-V-9.	[]
		m.	Open RC-V-10.	[]
		n.	Turn RC-V-11 counterclockwise to the 9 o'clock position and allow RC-EV-1 to vent.	[]

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DIABLO	NUMBER EP RB-16:B3 REVISION 0 DATE 7/19/84		
TITLE	SEN (NO	PAGE 8 OF 9	
		o. Close RC-V-10.	[]
		p. Turn RC-V-11 clockwise to CLOSED.	[]
		q. Open RC-V-8.1.	[]
		r. Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow.	[]
		Flush with demin water for 1 minute.	[]
		s. Close RC-V-2.	[]
		t. Open RC-V-1.X and flush with demin water for 5 minutes.	[]
		u. Close RC-V-1.X.	[]
		v. Terminate flushing by closing the following ve	alves. []
		RC-V-8.1 [] RC-V-8.2 [] RC-VREL-1 [] RC-VREL-2 [] RC-V-4 []	
	12.	At the PCP, close the remote flush isolation valve.	. []
	13.	At breaker panel PYNM11, place breaker #10 to the (position.	DFF []
	14.	Close sample cooler water.	[]
	15.	Call the Site Chem and Rad Protection Coordinator and inform him that the diluted reactor coolant sample and the off-gas sample are ready for transfer/analysis.	[]
	16.	Sample transfer.	[]
		a. Transfer the diluted gas sample to the TSC.	[]
		b. Using procedure EP RB-16:E, aliquot and analyz the diluted liquid sample for boron.	re []
	17.	Process the data according to procedure EP RB-16:F.	[]

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DIABLO	SENTRY POST-ACCIDENT SAMPLING SYSTEM REACTOR COOLANT STRIPPED GAS SAMPLING (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER REVISION DATE PAGE	EP RB-16:B3 0 7/19/84 9 OF 9
	REFERENCES		

 Sentry Equipment Corp. High Radiation Sampling System Operating and Maintenance Manual.

ATTACHMENTS

1. Valves for Obtaining Samples from Reactor Coolant.

Page 1 of 1

PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

TITLE: VALVES FOR OBTAINING SAMPLES FROM REACTOR COOLANT

ATTACHMENT 1

SAMPLE SOURCE	REMOTE PLANT ISOLATION VALVE (RPIV)	REMOTE SOURCE ISOLATION VALVE (RSIV)	REMOVE FLUSH ISOLATION VALVE (RFIV)	LSP SAMPLE SOURCE VALVE (SSV)
RC Hot Leg 1	FCV-9351 A	FCV-692	FCV-1416	RC-V-1.1
RC Hot Leg 4	FCV-9351 B	FCV-692	FCV-1416	RC-V-1.1
PZR Liquid	FCV-9350 B	FCV-693	FCV-1417	RC-V-1.2
PZR Steam	FCV-9350 A	FCV-694	FCV-1418	RC-V-1.3
RHR Pump 1-1 Discharge	FCV-9353 A	FCV-1413	FCV-1419	RC-V-1.4
RHR Pump 1-2 Discharge	FCV-9353 A	FCV-1413	FCV-1419	RC-V-1.4
VCT Liquid	N/A	FCV-1412	FCV-1420	RC-V-1.5

PC		Pacific Gas and Electric Company	NUMBER REVISION	EP RB-16:64 0
0	DEPARTM		DATE	7/19/84
U	DIABLO CA	ANYON POWER PLANT UNIT NO(S) 1 AND 2 EMERGENCY OPERATING PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM DILUTED LIQUID SAMPLING FROM RADWASTE (NOT INTENDED TO MEET THE 3-HOUR LIMIT)	PAGE	1 OF 5
	APPROVE	PLANT MANAGER	7-31-84 DATE	
DIS	SCUSSION	IM ENVIRO	PORTANT T	OUALITY

The purpose of this procedure is to detail the steps required to obtain a diluted liquid sample during accident conditions and complete module flushing.

The containment isolation valves FCV-696 and FCV-697 are controlled from the Containment Isolation Valve Panel in the Sentry Room only. These switches require a key to operate. A copy of the key is located in the control room; Radiation Protection Office, and in the Sentry Room in a key box with a breakable glass cover. These valves are to be opened only during an emergency or for testing.

PREREQUISITES

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- System was initially lined up as described in procedure EP RB-16:A.
- 2. Verify that the following annunciator windows are off on the PCP:
 - a. RADWASTE SAMPLE COOLING WATER LOW FLOW
 - b. RADWASTE SAMPLE COOLING WATER LOW PRESS
 - c. RADWASTE SAMPLE COOLING WATER HIGH TEMP
 - d. RADWASTE HIGH TEMP
 - e. LIQUID SAMPLE PANEL HIGH PLENUM PRESS
- The following equipment must be available and operational:
 - a. Meter-long reach rod
 - b. Hand operated vacuum pump
 - c. Sample cart/cask with 60 ml lift rod assembly

DIABLO C	ANYON P	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-16:B4 REVISION 0 DATE 7/19/84
TITLE	SENTR DI (NOT	Y POST-ACCIDENT SAMPLING SYSTEM LUTED LIQUID SAMPLING FROM RADWASTE INTENDED TO MEET THE 3-HOUR LIMIT)	PAGE 2 OF 5
	d.	A prelabeled 60 ml sample bottle with a new s	eptum
		 The label should have the sample source, estimated time of sample, and the initia person taking the sample (from this poin minutes). 	date, ls of the t estimate 17
<u>P</u>	RECAUTI	ONS	
1	. This radi	s sampling involves processing of water that wi ioactive. Precaution should be taken to preven ingestion.	ll be highly t skin contact
2	. Time perf it m cons	e in a radiation field should be limited to that form the required operations. During purge and may not be necessary to stand near the panels and ideration should be given to moving to a low do	t necessary to flush periods, nd ose rate area.
3.	A do sugg	ese rate instrument should be on and periodic mo mested during purge and sampling exercises.	onitoring is
PF	OCEDURE		
1.	Veri RW-R	fy RW-DV-1 is turned to BYPASS. Fill reservoir -1 with demin water.	[]
	a.	Open RW-V-10 and RW-V-9	[]
	b.	Adjust reservoir RW-R-1 until the water level in graduated cylinder RW-C-1 is 125 mls.	[]
	с.	Close RW-V-9 and RW-V-10.	[]
2.	Inse into	rt the needle of the hand operated vacuum pump the septum of the prelabeled 60 ml sample bott	le: []
	a.	Evacuate to the maximum vacuum achievable with the pump. The vacuum must be at least 15" of	Нд. []
	b.	Keep the pump connected to the bottle for 1 mi to assure that the bottle retains the vacuum.	nute []
3.	Turn state	on the switch to light the diluted bottle fill ion.	[]

DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 NUMBER REVISIO DATE PAGE						EP RB-16:84 N 0 7/19/84 3 05 5	
TITLE	SE (N	DILU	POST-A TED LI TENDED	CCIDENT SAMPLING QUID SAMPLING FR TO MEET THE 3-H	SYSTEM COM RADWASTE COUR LIMIT)		
4	•	Remove the be	e the ottle	bottle from the on the cart/cask	vacuum pump and place assembly cavity pisto	n.	[]
		a	Turn t to one the ca	he direction val down position a sk cavity.	ve for the hydraulic p nd lower the bottle in	iston to	[]
		b. (Close is wor	and open the cas king properly.	k to verify that the co	over	[]
		c. 1	Positi fill s	on the cart/cask tation needle an	under the diluted rade d set the brake.	waste	[]
	•	d. 1	Turn t piston onto t	he direction val to the up posit he needle.	ve for the hydraulic ion and raise the bott	le	[]
5.	(Open F at bre	RW-SV-	l by placing BKR panel PYNM11.	#10 to the ON position	1	[]
6.	1	Align	RW-V-	B to the 9 o'clo	ck position.		[]
7.	5	Sample	e Purg	ing			
	ä	a. C	close 1	the remote flush	isolation valve at the	PCP.	[]
		1	<u>WOTE</u> :	The sample source RW-V-2.1 thru RW procedure, the fit to indicate the The sample source have been given Chem and Rad Pro	ce valves are labeled N-V-2.3. Throughout th form RW-V-2.X will be u source valve to be ope ce used for sampling wi at the briefing by the otection Coordinator.	ris sed rated. 11 Site	
	b	o. 0 1	pen the for p	e sample source proper valve).	valve RW-V-2.X (see At	tachment	[]
	c	:. S f	lowly low.	open RW-V-4 unti Purge to waste f	il RW-FI-1 indicates 10 for 6 minutes.	0%	[]

DIABL	NUMBER EP RB-16:84 REVISION O DATE 7/19/84			
TITLE		PAGE 4 OF 5		
	8.	Sam	pling	
•		a.	Turn RW-V-8 to BYPASS.	[]
		b.	Close RW-V-2.X	[]
		c.	Close FCV-696 and FCV-697 if opened in step 7.a and notify the control room when closed.	. []
	9.	Ini	tial Flushing	
		a.	At the PCP, close the remote source isolation valve if applicable.	[]
		b.	Fully open RW-V-4	[]
		c.	Slowly open RW-V-3 until RW-FI-1 indicates 30% Flush with demin water for 2 minutes.	flow.
		d.	Close RW-V-4	[]
		e.	Open RW-V-2.X.	[]
		f.	Slowly open RW-V-4 until RW-FI-1 indicates 30% Flush with demin water for 3 minutes.	flow.
		g.	Close RW-V-2.X and RW-V-4	[]
		h.	At the PCP, open the remote flush isolation values (see Attachment 1 for proper value). Flush with demin water for 6 minutes.	n []
		i.	Close the remote flush isolation valve at the PC	ср. ГЛ
	10.	Samp	le Dilution	
		a.	Turn RW-DV-1 to SAMPLE	[]
		b.	Crack open RW-V-9 and add 23 mls of water from RW-C-1 to the sample bottle, then close RW-V-9. Record the volume added.	mls
		с.	Turn RW-DV-1 to BYPASS.	

ABLO CAN	SENTRY	Y POST-ACCIDENT SAMPLING SYSTEM LUTED LIQUID SAMPLING FROM RADWASTE INTENDED TO MEET THE 3-HOUR LIMIT)	REVISION O DATE 7/19/84 PAGE 5 OF 5
•	d.	Place the direction valve for the hydraulic piston in the down position and slowly lower the bottle into the cask.	[]
	e.	Close the cask.	[]
11.	Fina	1 Flushing	
	a.	Turn RW-V-8 to the 9 o'clock position.	[]
	b.	Slowly open RW-V-4 until RW-FI-1 indicates 1009 Flush with demin water for 2 minutes.	flow.
	c.	Turn RW-V-8 to BYPASS.	[]
	d.	Terminate flushing by closing the following val	lves:
		RW-V-4 []	
		RW-V-3 []	
12.	At b	reaker panel PYNMII, place BKR #10 to the OFF po	osition. []
13.	Samp	le Cask/Cart Removal	
	a.	Release the brake and remove the cart/cask from the sample station.	[]
	b.	Perform a radiation and contamination survey on cart/cask assembly and transfer the sample accorto EP RB-16:E or 16:J.	the ording
14.	Turn	off the diluted fill station light.	[]
REFE	RENCES	5	
1.	Sentrand M	ry Equipment Corp. High Radiation Sampling Syste Maintenance Manual.	m Operating
ATTA	CHMENT	21	
1.	Valve	es for Obtaining Samples from Radwaste.	

PACIFIC GAS AND ELECTRIC COMPANY Page 1 of 1 DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

	A	TTACHMENT 1		
SOURCE	CONTAINMENT ISOLATION VALVES	REMOTE SOURCE ISOLATION VALVE	REMOTE FLUSH ISOLATION VALVE	LSP SAMPLE SOURCE VALVE
Rx Cavity Sump	FCV-696 FCV-697	Not Applicable	FCV-1423	RW-V-2.1
Floor Drn Recvr	Not Applicable	FCV-1415	FCV-1425	RW-V-2.2
Equip Drn Recvr	Not Applicable	FCV-1414	FCV-1424	RW-V-2.3

TITLE: VALVES FOR OBTAINING SAMPLES FROM RADWASTE

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	DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 EMERGENCY OPERATING PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM TITLE UNDILUTED LIQUID SAMPLING FROM RADWAST (NOT INTENDED TO MEET THE 3-HOUR LIMIT) APPROVED <u>R.C. Mandun</u> PLANT MANAGER	NUMBER REVISION DATE PAGE TE 7-31-84 DATE	EP RB-16:B5 0 7/19/84 1 OF 5			
DIS		MPORTANT ONMENTAL	TO QUALITY			
The an i com	purpose of the procedure is to detail the steps r undiluted radwaste liquid sample during accident o plete module flushing.	equired to ob conditions and	tain			
PRE	REQUISITES					
1.	System was initially lined up as described in pr EP RB-16:A.	ocedure				
2.	Verify that the following annunciator windows ar	e off on the	PCP:			
	a. RADWASTE SAMPLE COOLING WATER LOW FLOW					
	b. RADWASTE SAMPLE COOLING WATER LOW PRESS					
	c. RADWASTE SAMPLE COOLING WATER HIGH TEMP					
	d. RADWASTE HIGH TEMP					
	e. LIQUID SAMPLE PANEL HIGH PLENUM PRESS					
3.	The following equipment must be available and op	erational:				
	a. Meter-long reach rod					
	b. Needle flush tool with demin water in a 15 m and a new septum.	ml sample bott	tle			
	c. Sample cart/cask with the 15 ml lift rod as	sembly.				
	d. A prelabeled 15 ml sample source, date, est sample, and the initials of the person takin (from this point estimate 16 minutes).	imated time of ng the sample				

DIABLO	NUMBER EP RB-16:85 REVISION O DATE 7/19/84 PAGE 2 OF F		
TITLE	SENTRY POST-ACCIDENT SAMPLING SYSTEM UNDILUTED LIQUID SAMPLING FROM RADWASTE (NOT INTENDED TO MEET THE 3-HOUR LIMIT)		
PRI	ECAUTIONS		
1.	This sampling involves processing of water that radioactive. Precautions should be taken to pre or ingestion.	will be highly went skin contact	
2.	Time in a radiation field should be limited to t perform the required operations. During purge a it may not be necessary to stand near the panels consideration should be given to moving to a low	hat necessary to nd flush periods, and dose rate area.	
3.	A dose rate instrument should be on and periodic suggested during purge and sampling exercises.	monitoring is	
PRO	CEDURE		
1.	Turn on the switch to light the undiluted fill s	tation. []	
2.	Place the bottle on the cart/cask assembly cavity	y piston []	
	 Turn the direction valve for the hydraulic p the down position and lower the bottle into cavity. 	piston in the cask []	
	b. Close and open the cask to verify that the oworking properly.	cover is []	
	c. Position the cart/cask under the undiluted r fill stations needles and set the brake.	radwaste []	
	d. Turn the direction valve for the hydraulic p to the up position and raise the bottle onto needles.	iston the []	
3.	Open RW-SV-1 by placing BKR #10 to the ON positio breaker panel PYNM11.	n at []	
DIABLO CA	ANYON	POWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-16:B5 REVISION O DATE 7/19/84
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TILE	SENTR	Y POST-ACCIDENT SAMPLING SYSTEM DILUTED LIQUID SAMPLING FROM RADWASTE INTENDED TO MEET THE 3-HOUR LIMIT)	PAGE 3 OF 5
4.	Sam	ple purging	
•	a.	Close the remote flush isolation valve at the (see Attachment 1 for proper valve).	PCP []
	NOTE	The sample source valves are labeled RW-V-2. RW-V-2.3. Throughout this procedure, the fo RW-V-2.X will be used to indicate the source to be operated. The sample source used for will have been given at the briefing by the Chem and Rad Protection Coordinator.	l thru rm valve sampling site
	b.	Open the sample source valve RW-V-2.X (see Att 1 for proper valve).	achment []
	c.	Slowly open RW-V-4 until RW-FI-1 indicates 100 Purge to waste for 6 minutes.	% flow. []
5.	Samp	ling	
	a.	Adjust RW-V-4 until RW-G-1 indicates 20 psig o	r less. []
	CAL	TION: Do not exceed 20 psig on RW-G-lin these	steps.
	ь.	Turn RW-V-7 to SAMPLE.	[]
	c.	Adjust RW-V-4 until RW-G-1 indicates 20 psig of RW-FI-1 indicates 40% flow. Purge for 1 minute	r e. []
	d.	Close RW-V-2.X.	[]
	e.	Let RW-G-1 return to 0 psig and wait 30 seconds allow bottle to depressurize.	s to []
	f.	Turn RW-V-7 to BYPASS.	[]
	g.	Close FCV-696 and FCV-697 if opened in step 4.a and notify control room when closed.	i. []
6.	Samp	le Cart/Cask Removal	
	a.	Turn the direction valve for the cart cask hydr piston to the down position and slowly lower th bottle into the cask.	raulic ne []

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DIABLO CA	NUMBER EP RB-16:B REVISION O DATE 7/19/84 PAGE 4 OF 5		
TITLE	SENTR		
	b.	Close the cask. Release the brake and remove the cart/cask from the sampling station and away from the LSP.	ne סייד רו
	с.	Install and secure the auxiliary shield.	11
	d.	Install and secure the needle flush tool onto th undiluted radwaste fill station needles.	ne []
7.	Ini	tial flushing	
	a.	At the PCP, close the sample source isolation va (See Attachment 1)	lve. []
	b.	Close RW-V-2.X (See Attachment 1)	[]
	с.	Fully open RW-V-4.	[]
	d.	Slowly open RW-V-3 until RW-FI-1 indicates 30% f Flush with demin water for 3 minutes.	1ow.
	e.	Close RW-V-4. []	
	f.	Open RW-V-2.X. []	
	g.	Slowly open RW-V-4 until RW-FI-1 indicates 30% f Flush with demin water for 3 minutes.	1ow.
	h.	Close RW-V-2.X and RW-V-4.	[]
	1.	At the PCP, open the remote flush isolation valve (see Attachment 1 for proper valve). Flush with demin water for 6 minutes.	e r 1
	j.	Close the remote flush isolation valve at the PC	р. ГЛ
8.	Fina	1 Flushing	
	a.	Turn RW-V-7 to SAMPLE	[]
	CAU	TION: Do not exceed 20 psig on RW-G-1 in this ste	p.

DIABLO C	SANY	SENTRY POST-ACCIDENT SAMPLING SYSTEM - UNDILUTED LIQUID SAMPLING FROM RADWASTE NOT INTENDED TO MEET THE 3-HOUR LIMIT)	MBER EP RB-16:85 VISION O TE 7/19/84 GE 5 OF 5
		b. Slowly open RW-V-4 until RW-G-1 indicates 20 psig RW-FI-1 indicates 30% flow. Purge for 2 minutes.	or []
		c. Close RW-V-4 and let RW-G-1 return to O psig. Wa 30 seconds to allow the bottle to depressurize.	it []
		d. Turn RW-V-7 to BYPASS.	[]
		e. Terminate flushing by closing RW-V-3.	[]
9.	•	Turn off the undiluted fill station light.	[]
10	0.	At breaker pane' PYNM11, place BKR #10 to the OFF position.	[]
11	1.	Remove the needle flush tool and survey bottle for disposal.	[]
12	2.	Perform a radiation and contamination survey on the car /cask assembly and move the sample according to procedu EP RB-16:J.	rt re []
RE	EFER	RENCES	
1.		Sentry Equipment Corp. High Radiation Sampling System O and Maintenance Manual.	perating

ATTACHMENTS

1. Valves for Obtaining Samples from Radwaste.

PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

	A	TTACHMENT 1		
SAMPLE	CONTAINMENT ISOLATION VALVES	REMOTE SOURCE ISOLATION VALVE	REMOTE FLUSH ISOLATION VALVE	LSP SAMPLE SOURCE VALVE
Rx Cavity Sump	FCV-696 FCV-697	Not Applicable	FCV-1423	RW-V-2.1
Floor Drn Recvr	Not Applicable	FCV-1415	FCV-1425	RW-V-2.2
Equip Drn Recvr	Not Applicable	FCV-1414	FCV-1424	RW-V-2.3

TITLE: VALVES FOR OBTAINING SAMPLES FROM RADWASTE

Page 1 of 1

NUMBER EP RB-16:C PGSE Pacific Gas and Electric Company REVISION 0 DATE 7/16/84 DEPARTMENT OF NUCLEAR PLANT OPERATIONS PAGE 1 OF 8 1 AND 2 DIABLO CANYON POWER PLANT UNIT NO(S) EMERGENCY PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM CONTAINMENT AIR SAMPLING TITLE (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT) R APPROVED PLANT MANAGER DATE INPORTANT TO DISCUSSION ENVIRONMENTAL QUALITY The purpose of this procedure is to detail the steps required to make containment air available for gas chromatography and to dilute a containment air sample for isotopic analysis of noble gases. particulates, and radionuclides. This procedure will also detail the steps for a complete system flush and return to the initial valve line up. After purging containment air through the G.C. and loading the diluter valve, this procedure will direct sampling personnel to EP RB-16:D. for gas analysis and to procedure EP RB-16:E, for preparation of the diluted containment air sample for isotopic analysis. The containment isolation valves FCV-698, FCV-699 and FCV-700 are controlled from the Containment Isolation Valve Panel in the Sentry Room only. These switches require redundant keys to operate. Copies of the keys are located in the Control Room , Radiation Protection Office, and in the Sentry Room in a key box with a breakable glass cover. These valves should be opened only during an emergency or for testing. PREREQUISITES System was initially lined up as described in procedure 1. EP RB-16:A. 2. Verify that the following annunciator windows are off on the PCP LIQUID SAMPLE PANEL HIGH PLENUM PRESS a. CHEMICAL ANALYSIS PANEL HIGH PLENUM PRESS b. с. CONTAINMENT AIR SAMPLE PANEL HIGH PLENUM PRESS DC0294 1111

DIABLO CAN	NYON P	OWER PL	ANT UNIT N	NO(S)	1 AND	2		NUMBER REVISION DATE PAGE	EP RB-16:C O 7/16/84 2 OF 8
	NTAIN	MENT AIR	R SAMPLII	NG THE 3-HO	UR TIME	LIMIT)			
3.	The	followi	ing equip	oment mu	ist be a	vailable a	nd oper	ational:	
	a.	Meter-	long rea	ach rod					
	b.	A gas	tight 50	c locki	ng syri	nge			
	с.	A 14cc	gas via	l with	a new s	eptum inst	alled		
	d.	Bags,	tape, ar	nd label	s				
	e.	Four c	hannel M	BIS Pre	ssure M	onitor (CA	SP-PI-1	109)	
	f.	Two cr	escent .	renches					
	g.	Spare	filter a	ssembli	es				
PRE	CAUTIO	INS							
1.	This high rele	s sampli ly radi ases to	ng invol oactive. the sam	ves pro Preca pling e	cessing utions nvironm	of contain should be f ent.	nment a taken t	ir that m o prevent	nay be
2.	Time perf it m cons	in a r orm the ay not iderati	adiation require be neces on shoul	field d opera sary to d be gi	should tions. stand i ven to r	be limited During pur near the pa moving to a	to tha rge and anels a a low d	t necessa flush pe nd ose rate	ry to riods, area.
3.	A do sugg	se rate ested d	instrum uring pu	ent sho rge and	uld be o samplin	on and per-	iodic m es.	onitoring	15
PRO	CEDURE								
1.	Samp	le Flas	k Evacua	tion					
	NOTE: Ensure that a loaded filter assembly is installed.								
	a.	Close	outlet v	alve of	the eng	gaged cart/	cask.		[]
	b.	Verify the bas	that an se of th	y unuse e CASP I	d CASP p have bee	oorts locat	ted at		[]
	c.	At the	CCP, pl	ace the	switch	for CCP-AN	/-1 to (OPEN.	[]
		NOTE:	This al	lows con	ntainmer	t pressure	to be		

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DIABLO CAN	YON PO	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE	EP RB-16:C 0 7/16/84
TITLE SEN	TAINM	POST-ACCIDENT SAMPLING SYSTEM MENT AIR SAMPLING ENDED TO MEET THE 3-HOUR TIME LIMIT)	PAGE	3 UF 8
	d.	Change the positions of the following valve	s:	
		CASP-DV-1 to Containment Supply		[]
		CASP-V-16 to CASP-SF-5		[]
	¢.	Contact the Control Room and request permiss FCV-700, the sample return containment isola succeeding steps FCV-698 and 699 will be ope Inquire whether the Control Room wants to be time each valve is operated or only when sam completed and containment isolation valves a obtain and record containment temperature and the Control Room.	ion to ope tion valve rated also notified pling is re closed. d pressure	n . In every Also from
		(°F + 460) x 5/9 =°K =	Tc	
		psig.		
	f.	Evacuate CASP-SF-5 by opening the following	valves:	
		FCV-700 (key operated)		[]
		CASP-V-17		[]
		CCP-AV-2		[]
		CCP-SV-10		[]
	g.	When CASP-SF-5 pressure is as low as apparent achievable as indicated on CASP-PI-1116, alig CASP-V-16 to CASP-DV-1. If vacuum is not he replace the filter assembly or septum and re- steps c. through f.	tly gn ld, peat	[]
2.	Samp	le Purge		
	a.	Open containment isolation valves FCV-699 and FCV-698 at the Containment Isolation Valve Panel and notify the Control Room, if request	d ted.	[]
	b.	Containment air is now being purged through a sample panel back to containment. Purge for 5 minutes.	the	[]

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DIABLO	SENTR) CONTA (NOT 1	POWER	ACCIDE	UNIT NO(S) NT SAMPLING MPLING EET THE 3-HI	1 AND 2 SYSTEM OUR TIME LIM	4IT)	NUMBER REVISION DATE PAGE	EP RB-16:C O 7/16/84 4 OF 8
	с.	At t air	the CC press	P, close CC ure as indi	P-SV-10 and cated on CAS	record conta SP-PI-1109.	inment	
						CASP-PI-110	9 f	osig
	d.	Samp	ole Pu	rge Through	the G.C.			
		1)	At t posi	he LSP, ali tion.	gn RC-V-15 t	to CASP TO GA	S CHROMAT	[]
		2)	At t	he G.C. con	trol panel d	to the follow	ing:	
			(a)	Depress MA	N			[]
			(b)	Press CLEA	R			[]
			(c)	Depress SA light is o	MP switch ar n.	nd verify red	sample	[]
			(d)	Select loo	p No. 1			[]
			(e)	Enter "23" G.C. Pur	to purge sa ge for 2 mir	ample from CA nutes.	SP to the	[]
			(f)	Enter "24"	to terminat	te the purge.		[]
			(g)	Release SA	MP switch to	OFF positio	n.	[]
			NOTE	: The samp the G.C.	le is now re	eady for anal	ysis with	
	e.	Reco	ord th	e temperatu	re indicated	d on THT 196.		
			0	C + 273 =	°K =	Ts		
	f.	Reco	ord Sa	mple Time				
	3. Sa	mple Di	ilutio	n —				
	a.	Alig the remo	gn CAS sampl ovable	P-DV-1 to C e aliquot i filter ass	ASP-SF-5. I nto CASP-SF embly.	N ₂ will flush -5 through th	e	[]

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DIABLO C	ENTRY DNTAIN	POST-	R PLANT UNIT NO(S) 1 AND 2 ACCIDENT SAMPLING SYSTEM AIR SAMPLING D TO MEET THE 3-HOUR TIME LIMIT)	NUMBER FEVISION CATE AGE	EP RB-16:C O 7/16/84 5 OF 8
	b.	When CASI ach	the pressure in CASP-SF-5 as indicated of -PI-1116 is 14.70 psia, or as high as evable, whichever is first, close CASP-V	on -17.	[]
	NOT	E: TI El a	e G.C. operator should be at Section 4.f. R5-16:D. When directed by the G.C. oper ign RC-V-15 to the CASP TO GAS CHROMAT. p	. of rator, position.	
	NOT	E: Do	not proceed with the next step until the erator directs this operation.	e G.C.	
4.	Ini	tial F	lushing		
	a.	If t perf	he G.C. was used for containment H ₂ analy orm the following steps, otherwise, skip	vsis, then to step b.	
		1)	At the LSP, align RC-V-15 to CASP TO GAS CHROMAT position.		[]
		2)	At the G.C. control panel, enter "13" to argon flush of sample line back to CASP. for 2 minutes.	start Flush	[]
		3)	Terminate argon flush by entering "14" a G.C. control panel.	t the	[]
		4)	At the LSP, align RC-V-15 to CLOSED posi	tion.	[]
	b.	Alig	CASP-V-16 to CASP-SF-5		[]
	c.	Open asser	CCP-SV-10 and flush removable filter bly for 1 minute.		[]
	d.	Close	containment isolation valve FCV-699.		[]
	e.	Open	CCP SV-5.		[]
	f.	Chang	e the positions of the following valves:		
		Align	CASP-DV-1 to Containment Supply		[]
		Aligr	CASP-V-16 to CASP-DV-1		[]
	g.	At th	e CCP, close CCP-AV-2 and CCP-SV-5.		[]

DIABLO CA	NYON F	POWER PLANT UNIT NO(S) 1 AND 2 NUMBER REVISION DATE	EP RB-16:C 0 7/16/84
TITLE CO	ENTRY DNTAIN NOT IN	POST-ACCIDENT SAMPLING SYSTEM MENT AIR SAMPLING TENDED TO MEET THE 3-HOUR TIME LIMIT)	6 UF 8
	h.		
		Close CCP SV 10 and CCP AV 2	[]
E	· ·	close cur-sv-lu and cur-Av-l.	[]
5.	Sall	pre nanoting	
	a.	to determine contact dose rates.	[]
		NOTE: Under worst case conditions, the contact dose rate of the filter, using a teletector, will be about 165 mR/hr. The contact dose rate at centerline of CASP-SF-5 will be about 44 mR/hr.	
	b.	Position the exhaust duct as close as possible to the removable filter assembly.	[]
	c.	Using the crescent wrenches, disconnect the filter assembly from the system, then separate the assembly into two halves and place the two halves in a bag, seal, and survey.	[]
		 Place a prewritten label on the bag. The label should have the name of the sample, dose rate, time containment air pressure, and the initials of the sampler. 	[]
		2) Store the sample to minimize exposure from it.	[]
	d.	Install a new filter assembly into the system making sure the connections are tight.	[]
	e.	Partially evacuate a septum sealed 14cc gas vial by withdrawing 2cc from it using a syringe.	[]
	f.	Flush a 5 ml gas tight syringe by inserting its needle into the septum of CASP-SF-5, withdrawing lcc and injecting it again.	[]
	g.	Using the flushed syringe withdraw a 2cc sample	

DIABLO CAN	NTPY	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE PAGE	EP RB-16:C 0 7/16/84 7 @F 8		
	CONTAINMENT AIR SAMPLING (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)					
	h.	Inject the syringe contents into the evacuated 14cc gas vial.	đ	[]		
	i.	Place the gas vial into a bag, seal and survey	ít.	[]		
	j.	Place a prewritten label on the bag. The labe shall have the name of the sample, dose rate, time, cont. air pressure, volume of 1 ml and t	el the			
		initials of the sampler.		[]		
	K.	store the sample to minimize exposure from it.		[]		
6.	Fina	il Flushing				
	a.	Align CASP-V-16 to CASP-SF-5.		[]		
	ь.	Open the following valves:				
		CCP-AV-2 []				
		CCP-SV-10 []				
		CASP-V-17 []				
	c.	Evacuate CASP-SF-5 until vacuum is as low as achievable as indicated on CASP-PI-1116		[]		
	d.	Close CCP-AV-2 and allow N_2 to fill CASP-SF-5.		[]		
	e.	Repeat steps 18.b. through d. above once more.		[]		
	f.	Close CCP-SV-10.		[]		
	g.	Open the OUTLET valve on the engaged cart/cask		[]		
	h.	Open CCP-SV-10.		[]		
	i.	Open CCP-SV-1.2 and allow $\rm N_2$ to flush the line for 2 minutes.		[]		

DIABLO CAN	YON POWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE	EP R5-16:C 0 7/16/84
	NTRY POST-ACCIDENT SAMPLING SYSTEM NTAINMENT AIR SAMPLING OT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	PAGE	8 OF 8
7.	Terminate flushing by closing the following valve	s :	
•	CCP-SV-10 []		
	CCP-SV-1.2 []		
	CCP-AV-1 []		
8.	Change the positions of the following valves:		
	CASP-V-16 to CASP-DV-1 []		
	CASP-DV-1 to CASP-SF-5 []		
9.	Turn OFF and disconnect the CASP-PI-1109, MBIS Pressure Monitor connected to the cart/cask.		[]
10.	At the Containment Isolation Valve Panel CLOSE the following valves and notify the Control Room that they are closed:	1	
	FCV-698 []		
	FCV-699 []		
	FCV-700 []		
11.	At the CMP, turn the power switch to OFF if it was and at the CCP turn the FUNCTION SELECT switch to OFF and deenergize the heat tracing.	ON	[]
12.	Process the data according to procedure EP RB-15:W	1.	[]
REFE	RENCES		
1.	NUREG 0737		
2.	Diablo Canyon Shielding Review.		

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	PACIFIC Gas and Electric Company DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NC(S) 1 AND 2 EMERGENCY OPERATING PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM TITLE GAS CHROMATOGRAPHIC HYDROGEN ANALYSIS (NOT INTENDED TO MEET THE 3-HOUR LIMIT) PPROVED	NUMBER REVISION DATE PAGE <u>7-31-84</u> DATE	EP RB-16:D O 7/19/84 1 OF 6
DISC		ORTANT TO) JALITY
The dete the chro RC-V anal proc	purpose of this procedure is to detail the steps rmine the dissolved hydrogen concentration in rea percent hydrogen concentration in containment air matography. This procedure will detail hydrogen -15 on the LSP to the Gas Chromatograph. The sam ysis should be prepared according to any of the f redures:	required to ctor coolant by gas analysis from ple gas for ollowing	and m
	EP RB-16:B EP RB-16:C		
PREF	REQUISITES		
1.	The Gas Chromatograph (G.C.) should be in the OM condition for a minimum of 30 minutes before same	l or STANDBY mple analysis	•
2.	The gas sample for analysis should be available transfer to the G.C.	at the LSP f	or
3.	Carrier gas (Ar) should be available with cyling pressure > 1000 psig.	der outlet	
PRE	CAUTIONS		
1.	Monitoring with a dose rate instrument should be transfer of sample to the G.C.	e done during	g the
2.	If the carrier gas cylinder empties while the G thermal conductivity detector (TCD) protection off the current to the TCD.	.C. is in use device will i	e, the turn

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ABLO CANYO	N POW	ER PLAN	T UNIT NO(S)	1 AND 2		NUMBER REVISION DATE PAGE	2 OF 6
SENT	RY PO AS CH INTE	ST-ACCI ROMATOO NDED TO	GRAPHIC HYDRO MEET THE 3-	GEN ANALYSIS HOUR LIMIT)			
. PROCE	DURE						
1.	Analy	sis Pr	ogram				
	a.	Releas	e all pushbut	tons and depre	ss the CLEA	R button.	[]
	b.	Check the tw number memory Plater	that the foll o digit STEP s are as show is correct, Stabilizatio	owing program number and ver n below. Do t proceed to Ste on.	is in memor ify that th his for eac p 2.	y by enteri e TIME and h STEP. If	ng CODE the []
			STEP	TIME	CODE		
			01 02 03 04	00:01 00:02 00:30 01:15	03 25 01 00		
	c.	If th	e program is	not correct, e	nter the pro	ogram as fo	11ows:
		1)	Depress ENTER	and CLEAR			[]
		2)	Enter the abo digit pairs i	we program int in the sequence	o memory by shown abov	entering t e.	he two []
		NOTE :	If antry diy and	error is made re-enter the	e, depress C entire line	LEAR to bla	nk
		3)	Release ENTER	R, depress CLE	AR and repea	t step 1.b.	[]
2.	Pla	ten Sta	bilization				
	а.	Depre	ess MAN and C	LEAR			[]
	b.	Check follo	k to see if t owing:	he G.C. has st	abilized by	doing the	
		1)	Select atten	uation factor	of 250 (25	x 10)	[]
		2)	Enter "O1" a temp and rec	nd then "35" t ord for a mini	o display s mum of	et point of	platen []

DIABLO CAN	ON POWER PLANT UNIT NO(S) 1 AND 2 REVISION DATE PAGE	7/19/84 3 OF 6
	TRY POST-ACCIDENT SAMPLING SYSTEMS GAS CHROMATOGRAPHIC HYDROGEN ANALYSIS T INTENDED TO MEET THE 3-HOUR LIMIT)	
•	 Enter "45" to display actual platen temperature a record for a minimum of 30 seconds. 	nd []
	NOTE: Stabilization is complete when platen set-point actual temperature are within 1/2 grid marking each other as indicated on the G.C. chart recor only.	and of der
	 Enter "00" and mark chart recorder on the G.C. wi date, time, and initials. 	th []
3.	Calibration Verification	
	NOTE: If analysis is required on a second sample source, t the G.C. calibration verification is not needed agai Proceed to Step 4, Sample Analysis.	hen n.
	NOTE: Only 1 span gas is needed to verify calibration. The following steps describe the use of either gas. Per this step only if directed by supervision.	form
	 Enter "23" to evacuate the G.C. Continue evacuation u the red HI VACUUM light is on. 	until []
	b. Enter "24" to terminate evacuation of the G.C.	[]
	c. Select attenuation factor of 500 (5 x 100) for the 109 source or 5 (5 x 1) for the 2000 ppm H ₂ source.	^{в н} f ј
	d. Depress CAL-1 switch for 10% H, source, or CAL-2 switc 2000 ppm H, source, and wait 10 seconds after amber LO VACUUM light is on.	ch for DW []
	e. Release CAL-1 or CAL-2 switch and wait 10 seconds.	[]
	f. Start the L&N recorder.	[]
	9. Depress AUTO switch to on (in) and press CLEAR. Wait the G.C. display clock has timed to a minimum of 3 minutes. During this time interval, identify the L&N recorder trace with the date/time, gas used, loop num attenuation factor and operator initials.	until ber, []

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DIABLO CANYON	OWER PLANT UNIT NO(S) 1 AND 2 RI	JMBER EP RB-16:1 EVISION O ATE 7/19/84 AGE 4 OF 6
TITLE SENTRY	POST-ACCIDENT SAMPLING SYSTEMS CHROMATOGRAPHIC HYDROGEN ANALYSIS ITENDED TO MEET THE 3-HOUR LIMIT)	
. h.	Release AUTO switch to off (out) position. Pres	s CLEAR and
1.	Stop the L&N recorder.	[]
j.	Calculate the hydrogen peak height as follows:	
pe	ak height = (Trace peak height - baseline) x atten	uation
	peak height =	
k	Compare the peak height calculated against the on the concentration versus peak height curve f attenuation factor and calibration gas. The value within \pm 10 percent of each other.	value shown or the same lues should []
4. 5	ample Analysis	
	. Depress SAMP switch and verify red sample light	tison. []
	. Select loop No. 1.	[]
	Enter "23" to evacuate the G.C. until the red light is on.	L I WUUDAV IH
	 Cycle loop selector through loops 2, 3, a at each loop and evacuating until the HI is on. 	nd 4, pausing VACUUM light []
	 Cycle a minimum of 3 times through loops and 4, pausing at each loop. 	1, 2, 3, []
1.181.54	 Select loop number 1. 	[]
1 1 1 1 1 1	d. Enter "24" to terminate evacuation.	[]
	e. Select attenuation factor of 500 (5 x 100).	[]
	NOTE: Before proceeding consult with the LSP assure that a gas sample is available	operator to at RC-V-15.
	f. When the appropriate gas sample is available align RC-V-15 to one of the following position	at RC-V-15 ons:

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DIABLO CAN	NYON PO	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE PAGE	EP RB-16:D D 7/19/84 5 OF 6
	GAS C	POST-ACCIDENT SAMPLING SYSTEMS CHROMATOGRAPHIC HYDROGEN ANALYSIS TENDED TO MEET THE 3-HOUR LIMIT)		
•		 LSP TO GAS CHROMAT. for reactor coolant sample. 	off-gas []
		2) CASP TO GAS CHROMAT. for containment air	sample. []
	g.	Cycle loop selector through loops 1, 2, 3, an each loop. Cycle 3 times.	d 4, pausing	at]
		1) Select loop 1	[]
	h.	Align RC-V-15 to the CLOSED position.	[]
		NOTE: If the analysis applies to containment to step "j".	air, procee	d
	i.	Record the pressure on RC-G-2.1 on the data s EP RB-16:F. Reading: psig	sheet,	
		NOTE. The pressure is normally between 5 and	1 7 psig.	
		NOTE: Notify the main LSP operator when RC-1	V-15 is close	d.
		NULE: Notify the main Lor operator mit. No .	1	1
	J.	Start the Law recorder, wait 5 seconds.	FAR I	
	κ.	 Wait until the G.C. display clock has to minimum of 3 minutes. During this time identify the recorder trace with sample date/time, loop number, attenuation fac- initials. 	imed to a interval name, tor and opera	ator
	1.	Release AUTO switch to off (out) position. enter "00".	Press CLEAR	and []
	m.	Stop the L&N recorder.		[]
	n.	Calculate the net peak height and determine concentration from the appropriate calibrati	the hydrogen on curve.	[]
		peak height =	mm	
	0.	Record the net peak height on the recorder t the analysis and select the next loop and ap attenuation factor (5 x 1, 25 x 1, 1 x 100, required. Repeat steps j. through o. as nec satisfactory data.	race. Repea propriate or 5 x 100) essary to ob	t as tain []
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DIABLO CANYON	POWER PLANT UNIT NO(S) 1 AND 2	NUMBER REVISION DATE PAGE	EP RB-16:D O 7/19/84 6 OF 6
TITLE SENTR	POST-ACCIDENT SAMPLING SYSTEMS CHROMATOGRAPHIC HYDROGEN ANALYSI NTENDED TO MEET THE 3-HOUR LIMIT)	S	
p	Purge the G.C. residual gas as	follows:	
	 Enter "23" and evacuate t VACUUM light is on. 	he G.C. until the red HI	[]
	 Cycle through each loop a VACUUM light is on. 	ind evacuate until the re	1 H I []
	3) Enter "13" to initiate an	rgon purge.	[]
	 Cycle loop selector throup pausing at each loop. Cy 	ugh loops 1, 2, 3, and 4, yole 3 times.	[]
	5) Enter "14" to terminate	the purge.	[]
	6) Enter "24" to terminate	the evacuation.	[]
	7) Enter "00".		[]
	8) Release SAMP switch to o	ff position.	[]
	. After final use of G.C.		
	1) Shutdown the instrument	by turning off the power	. []
	2) Secure the gas supplies	for the GC.	
	a) CLOSE the 3 root va	alves next to the CAP.	[]
	b) CLOSE CAP-V-10		[]
	c) CLOSE CAP-V-14		[]
	. Return to the referencing pr	ocedure.	
	NOTE: For stripped-gas, thi Containment Air, this	s is EP RB-15:II. step 17 is EP RB-15:III, step 5.	7. For
	 Record the net peak height f data sheet. 	rom step n. on the approp	priate
REFE	ENCES		
1.	Sentry Equipment Corp. High Radia and Maintenance Manual.	ation Sampling System Ope	rating

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PG	Pacific Gas and Electric Company	NUMBER REVISION	EP RB-16:E
2	DEPARTMENT OF NUCLEAR PLANT OPERATIONS	DATE	7/17/84
U	DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 EMERGENCY PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM TITLE LIQUID AND GAS SAMPLE HANDLING (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	PAGE	1 OF _. 15
<u>к</u> .	APPROVED - R. C. Thember PLANT MANAGER	7-31-84 DATE	

SCOPE

IMPORTANT TO ENVIRONMENTAL QUALITY

This procedure provides guidance for safely handling post accident liquid samples obtained from the Reactor Coolant System (RCS) using the SENTRY PASS. The <u>diluted</u> liquid sample from the RCS is aliquotted. The aliquot may be used for boron or for y-assay. Further dilutions for y-assay are done in the hot cell. Likewise, steps for preparation of diluted containment air samples for counting are also detailed. This procedure and changes thereto require PSRC review.

DISCUSSION

Based on worst-case post accident assumptions regarding sample radioactivity content, special precautions may be required for handling liquid and containment air sample acquired using the Sentry PASS. Sample aliquots are transferred by precision pipets to a dilution vial for radiological counting or an appropriate reaction flask for chemical analysis. These flasks may be kept inside the hot cell throughout the procedure to minimize personnel exposures and also to contain the airborne radioactivity generated within the hot cell area. Control of airborne activity is accomplished by use of an overhead ventilation duct which creates a slightly negative pressure inside the enclosure. After all sample manipulations are completed, the radioactive waste solutions may be flushed down the Sentry Room sink via the receiver funnel drain valve and, if necessary, the inside surfaces of the hot cell may be sprayed down to reduce the contamination levels within the sample handling area.

PREREQUISITES AND PRECAUTIONS

 Personnel assigned to conduct this procedure should be familiar with the considerations of handling highly radioactive liquid and gas samples and shall be experienced with the analytical chemistry techniques employed in this procedure. Also, any individual performing this procedure should be capable of:

TITLE.	SENT LIQUINTE	YON POWER PLANT UNIT NO(S)1 AND 2NUMBEREP RB-16:ETRY POST-ACCIDENT SAMPLING SYSTEMDATE7/17/84UID AND GAS SAMPLE HANDLING (NOT ENDED TO MEET THE 3-HOUR TIME LIMIT)PAGE2 OF 15
		 Making does rate measurements with portable survey instruments.
		 Assessing response and basic trends of continuous air monitoring equipment.
		c. Taking actions based on items 1.a and 1.b.
	2.	Unless conditions are known to warrant less stringent precautions, complete protective clothing and accident dosimetry (including high range and extremity dosimeters) will be required. Lapel air samplers are also recommended. Full respiratory protection equipment (SCBA) may also be necessary.
	3.	To minimize time spent in hot sample handling, ensure availability of the required equipment for performing applicable portions of this procedure. This includes sample vessels, pipets, handling tools, reagents, etc. A comprehensive listing of these supplies is provided in a check list format in Appendix 1 to this procedure to facilitate the review.
	4.	When the liquid sample is handled, there is a possibility that local radiation levels and airborne radioactivity could increase. Since the sample is to be contained within the hot cell, the increases should not be too high; however, as precautionary measure, all individuals within the Sentry Room should have functioning respirators. Monitoring should be performed using survey instruments (for dose rates) and any available CAM system (for airborne) for early identification of potential problems.
	5.	This procedure is designed to permit all sample handling to be performed by the use of tongs or other remote handling devices. Unless the samples are surveyed and known not to present a significant source of exposure to the fingers, hands or other extremities, no sample manipulations involving <u>direct</u> hand contact should be attempted.
	PRO	CEDURE
	1.	Preparation of Sample Enclosure and Sink Area
		This section covers the preliminary steps required before

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ABLO	CANYON P SENTRY P LIQUID A INTENDED	WER PLANT UNIT NO(S)1 AND 2NUMBEREP RB-16:EST-ACCIDENT SAMPLING SYSTEM D GAS SAMPLE HANDLING (NOT TO MEET THE 3-HOUR TIME LIMIT)D ATE PAGE7/17/84 PAGE
	tha are min cel	all required handling equipment and reagents to be employed available prior to handling the liquid sample in order to nize time spent working around hot samples within the hot
	a.	Initial Survey of Sample Enclosure and Sink Area
		 Perform a radiation survey of the hot cell area to verify that no highly radioactive sample material remains inside or around the enclosure from a previous use. If an indication of radioactive sample materials is found, these materials should be promptly disposed of as set forth below under "Clean-Up" in Section 6 of this procedure.
		 Visually inspect the inside of the hot cell for unwanted material and for cleanliness. If material remains, remove and store or discard it, whichever is appropriate.
	b.	Acquisition of Required Supplies
		Assemble the necessary supplies, equipment, etc. to perform the required steps. A listing of these supplies is presented in Appendix 1 to this procedure for the following preparation and analysis categories.
		1) General Equipment Requirements (Sections 1, 2, and 6)
		 Dilution of Liquid Sample for Radiological Counting (Section 3)
		3) Chemical Analysis for Boron Levels (Section 4)
		4) Dilution of Off-gas for Isotopic Analysis (Section 5)
		5) Containment Air Fractionation Supplies
	с.	Preparation of Hot Cell Area for Use
		1) Open the access door to the hot cell

SENTRY POST.	ACCIDENT SAMPLING SYSTEM
LIQUID AND C	AS SAMPLE HANDLING (NOT MEET THE 3-HOUR TIME LIMIT)
. 2)	Close the receiver funnel drain valve.
3)	Fill the receiver funnel with demin water.
4)	Open receiver funnel drain valve and verify liquid drains in an unrestricted manner.
	NOTE: If flow is obstructed, it may be necessary to blow out the drain line. This line <u>must</u> drain freely prior to using the hot cell for analyses. A squeeze bulb or Oxford pipet with plastic tip may be used to force flow.
5)	Carefully position shielded sample holder brick for use in conjunction with pipet operations.
6)	If a liquid sample for radiological analysis is to be diluted pursuant to Section 3 of this procedure, install an uncapped, clean 20 cc liquid scintillation vial into its appropriate sample port within the sample holder brick. Leave the cap and sealing tape outside the hot cell for later use.
7]	If a Boron analysis is to be performed (pursuant to Section 4), install two 50 ml Erlenmeyer flasks into their appropriate sample ports within the sample holder brick. Leave rubber stopper caps (one for each 50 ml flask) outside the hot cell for later use.
8)	If a Boron analysis is to be performed, install a clean, uncapped, prewiped 1 cm path length photocell into the appropriate sample port within the sample holder brick. Keep the cap plug available outside the hot cell for later use.
<u>N</u>	TE: Be careful not to scratch the transmission surfaces nor to deposit extraneous material (e.g powder or lint) especially from gloves.
9)	Check that a RO-7-BM probe, or appropriate range probe, is installed in the mount above the receiving funnel. The probe should be 5 inches above the base of the hot

SEN LIQ	TRY P UID A ENDED	OWER P OST-AC ND GAS TO ME	PLANT UNIT NO(S) 1 AND 2 CIDENT SAMPLING SYSTEM S SAMPLE HANDLING (NOT SET THE 3-HOUR TIME LIMIT)	NUMBER EP RB-16:E REVISION O DATE 7/17/84 PAGE 5 OF 15
			cell. The attached cable should run thr chimney and fit in the slot provided for the cable to the RO-7 and turn the detect	rough the vent r it. Connect ctor on.
		10)	Place the power cord for the magnetic st along the same path as the cable mention	tirrer, if used, med above.
		11)	Verify air flow (a piece of paper is su the elephant trunk vent shroud.	uggested) into
		12)	Connect ventilation shroud to the chimne cover switch.	y on top of
		13)	Prepare remaining equipment, materials, required for the planned sample manipula analyses.	reagents, etc. tions and
2.	Obta	ining	a Liquid Sample from the cart/cask	
	a.	Move	the cart/cask to the sink area and set t	he brake.
	b.	Uncon from	ver the sample vial by rolling the radiat the sample cavity.	ion shield away
	c.	Place the a read	e an RO-2A over the funnel in the hot cel ambient background response of the RO-2A. ing and then remove the RO-2A.	l and determine Not the
		R0-24	A Reading:mR/hr (ambient)	background)
	d.	Aliqu	not a sample of the diluted reactor coolar	nt:
		1)	Transfer the bottle containing the dilute the hot cell and remove the lid.	ed liquid to
		2)	Close the cask and move it away.	
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DIABLO	SENT	ON PO	WER PLANT U	NIT NO(S) 1 AND 2 SAMPLING SYSTEM	NUMBER EP RE-16:E REVISION O DATE 7/17/84 PAGE 6 OF 15
TITLE	LIQU	ID ANI NDED	D GAS SAMPL TO MEET THE	E HANDLING (<u>NOT</u> 3-HOUR TIME LIMIT)	
			3) Close	the access door to the hot cell	
•		e.	Measure the reading.	e radiation level with the RO-7	and record the
				mR/hr (ambient backgro	und plus sample)
		f	Calculate step 2.c.	the net sample reading by subtra- from the value of step 2.e.	cting the value of
				mR/hr (step 2	.e.)
				mR/hr (step 2	.c.)
				mR/hr (net sa	mple reading)
2.5	3.	Dilu	tion and Pr	eparation of Liquid Sample for R	adioassay
		This obta samp	step invol in a counti le volume i	ves selection and dilution of a ng geometry of 10 mls liquid in s based on the exposure rate rec	sample aliquot to a 20 ml vial. The orded in Step 2.f.
		a.	Select the follows:	appropriate pipet tip size and	pipet volume as
			Pipet	Approx. Step 2.g. Reading	Check
			5 ml 1 ml 100 µl 10 µl	< 1.6 mR/hr > 1.6 mR/hr but < 16 mR/hr > 16 mR/hr but < 160 mR/hr > 160 mR/hr	
		b.	Open the a	ccess door on top of shielded sa	mple enclosure.
		с.	Using the obtain thi funnel, ke sample liq	pipet volume setting chosen in S s volume of RCS liquid sample fr eping hands as far away as possi uid.	tep 3.a.) above, om the receiver ble from the "hot"

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d. f. g. h. i.	Slowly discharge the aliquot into the empty 20 cc liquid scintillation vial previously placed within the shield brick. Discard the pipet tip. MOTE: Dispose of materials that have contacted highly contaminated mediums separately from those that have not. Using the appropriate pipette and tip, add sufficient demin water to the 20 cc vial to bring the total liquid volume to 10 ml. Add 10 mls to the 10µl or 100µl aliquot. Remove the diluted sample from the hot cell with tongs. Cap the vial. Wipe it and seal it with tape. Screen survey the vial to verify countability (≤ 5 mR/hr contact).
e. f. g. h. i.	NOTE: Dispose of materials that have contacted highly contaminated mediums separately from those that have not. Using the appropriate pipette and tip, add sufficient demin water to the 20 cc vial to bring the total liquid volume to 10 ml. Add 10 mls to the 10µl or 100µl aliquot. Remove the diluted sample from the hot cell with tongs. Cap the vial. Wipe it and seal it with tape. Screen survey the vial to verify countability (≤ 5 mR/hr contact).
e. f. g. h. i.	Using the appropriate pipette and tip, add sufficient demin water to the 20 cc vial to bring the total liquid volume to 10 ml. Add 10 mls to the 10µl or 100µl aliquot. Remove the diluted sample from the hot cell with tongs. Cap the vial. Wipe it and seal it with tape. Screen survey the vial to verify countability (< 5 mR/hr contact).
f. g. h. i.	Remove the diluted sample from the hot cell with tongs. Cap the vial. Wipe it and seal it with tape. Screen survey the vial to verify countability (< 5 mR/hr contact).
g. h. i.	Cap the vial. Wipe it and seal it with tape. Screen survey the vial to verify countability (< 5 mR/hr contact).
h. i.	Screen survey the vial to verify countability (< 5 mR/hr contact).
i.	Label and had the vial noting the dilution the aliquet
	volume used, and the radiation level measured.
j.	Set the sample aside for transport to the TSC or counting room.
k.	If a chemical analysis for Boron is to be performed, proceed below to Section 4. If no chemical analysis is to be performed, proceed below to Section 6 to clean up and secure the hot cell for later use.
4. Analy	ysis of Liquid Sample for Boron
This modi Samp	section is a version of CAP C-17 "BORON COLORMETRIC", fied to permit the application to highly radioactive samples. le manipulations are performed primarily within the hot cell.
It is for t asser	s assumed that the reagents, equipment and supplies required this procedure (which are itemized in Appendix 1) are mbled for use as specified in Section 1.b.

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DIABLO CANYON PO	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-16:E REVISION O DATE 7/17/84
LIQUID A	ND GAS SAMPLE HANDLING (NOT TO MEET THE 3-HOUR TIME LIMIT)	FASE O OF 15
a.	Pipet 5.00 ml of the standard boric acid so ml volumetric flask and dilute to the mark w The concentration of boron in this flask is actual concentration of the standard solutio 10 ppm). Note the actual concentration in t this standard as a check on the calibration	lution into a 100 with demin water. 1/20 of the on (approximately the flask and run curve.
b.	Pipet 2 ml of the 10 ppm boron standard solu ml Erlenmeyer flask. Pipet 2 ml of demin wa second 50 ml Erlenmeyer flask. (Both these outside the hot cell.)	ution into a 50 ater into a flasks should be
с.	Open the access door on top of the hot cell.	
d.	Pipet a 2 ml aliquot of the liquid sample so receiver flask into one of the 50 ml Erlenne within the hot cell. (The other flask may be back-up vessel or if desired, it may be used duplicate "hot" sample.	olution from the eyer flasks be reserved as a d to prepare a
	NOTE: Open hot cell access lid whenever so to a flask. Close it immediately af	mething is added terwards.
е.	Pipet 10 μl of concentrated HCl to each fla swirl. Allow flasks to cool (\sim 2 minutes).	sk stopper and
f.	Add 10.0 ml of concentrated H ₂ SO ₄ into each and swirl. Allow flasks to cool room tempe minutes).	flask, stopper rature (~ 15
g.	Add 10.0 ml of carminic acid solution into Stopper again and, using tongs, swirl to mi	each flask. x well.
h.	Turn on the spectrophotometer and allow it Absorbance should be read 45 to 60 minutes acid is added. Note the time.	to warm up. after carminic

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DIABLO	SENTRY PO LIQUID A INTENDED	DWER PLANT UNIT NO(S) 1 AND 2 DST-ACCIDENT SAMPLING SYSTEM ND GAS SAMPLE HANDLING (NOT TO MEET THE 3-HOUR TIME LIMIT)	NUMBER EP RB-16:E REVISION O DATE 7/17/84 PAGE 9 OF 15
	1.	Being careful to avoid direct hand contact cuvettes, between approximately 40 and 55 m carminic add, transfer solutions to clean, cuvettes and carefully cap them. This may using a 5 ml pipet set for 4 ml, and, in th "hot" sample the capping and cuvette transf performed using tongs.	with the finutes after the prewiped 1 cm be accomplished e case of the er must be
	j.	Set the spectrophotometer to a wavelength o adjust the blank for 0% absorbance.	f 585 nm and
	k.	Read the boron standard to verify agreement graph within ±5%. If this agreement is not continue the analysis but inform supervisio	with calibration obtained n immediately.
	1.	Read the absorbance of the sample(s). Reco return the samples to the hot cell. (Absorbance RCS) Calibration Graph (Standard Curve) ppm Boron RCS (diluted) =	rd results and
	т.	Record this on the data sheet in EP RB-16:F Notify the Site Chemistry and Radiation Pro-	, Section (4) tection
	n.	Coordinator of results of sample analysis. Turn the spectrophotometer off and proceed below.	to Section 5

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Dilution and Dilution and NOTE: Perfi mR/hi a. Obtain and us from t b. Insert lcc. vial. c. Insert the sy	AMPLE HANDLING (NOT THE 3-HOUR TIME LIMIT) d Preparation of Off-gas fo orm steps below only if sam r. a clean 14 cc gas sample v ing a 5 ml gas tight syring he vial and discharge the a the syringe into the off-g Shut the valve on the syrin	r Isotopic / ple vial do: ial with a s e, withdraw ir from the as sample v ge before re	Analysis se rate is >5 septum installed l cc of air syringe. ial and remove emoving the
Dilution and NOTE: PerformR/h a. Obtain and us from to b. Insert lcc. vial. c. Insert the sy	d Preparation of Off-gas for orm steps below only if sam r. a clean 14 cc gas sample w ing a 5 ml gas tight syring he vial and discharge the a the syringe into the off-g Shut the valve on the syrin	r Isotopic / ple vial do: ial with a s e, withdraw ir from the as sample v ge before re	Analysis se rate is >5 septum installed 1 cc of air syringe. ial and remove emoving the
NOTE: Perf mR/h a. Obtain and us from t b. Insert lcc. vial. c. Insert the sy	orm steps below only if sam r. a clean 14 cc gas sample w ing a 5 ml gas tight syring he vial and discharge the a the syringe into the off-g Shut the valve on the syrin	ple vial do: ial with a s e, withdraw ir from the as sample v ge before re	se rate is >5 septum installed 1 cc of air syringe. ial and remove emoving the
 a. Obtain and us from t b. Insert lcc. vial. c. Insert the sy 	a clean 14 cc gas sample w ing a 5 ml gas tight syring he vial and discharge the a the syringe into the off-g Shut the valve on the syrin	ial with a s e, withdraw ir from the as sample v ge before re	septum installed 1 cc of air syringe. ial and remove emoving the
 b. Insert lcc. vial. c. Insert the sy 	the syringe into the off-g Shut the valve on the syrin	as sample v ge before r	ial and remove emoving the
c. Insert the sy	the syringe into the count		
	ringe and inject the conter	ing vial; of ts into the	pen the valve on vial.
d. Survey mR/hr, clean than 5	the newly prepared vial; i repeat steps a. through e. 14 cc gas sample vials unti mR/hr, keeping track of th	f the dose above, dil 1 the sampli e number of	rate is >5 uting into new e vial is less dilutions.
e. Place as fou factor 15:1.	a label on the counting via nd on the original vial. (by multiplying all dilution Record this information or	l repeating alculate the ons together on the data s	the information e new dilution . Each dilution heet.
f. Inquir should direct	e from supervision whether be discarded or stored for ed.	the origina future use	l sample vials and perform as
Cleaning an	d Securing the Hot Cell		
a. Cleani	ng		
1) D	isposal of Radioactive Sam	le Residues	
D a m d	uring these actions, the rarea and airborne concentrates ay become higher since the lischarged via the sink.	diation lev tions within sample mate	els in the sink the Sentry Room rials are being
a) Turn on sink drain fau steady stream.	cet to provi	de a slow,
e 1	clean than 5 2. Place as fou factor 15:1. 5. Inquir should direct Cleaning an a. Cleani 1) D a m d a	 clean 14 cc gas sample vials untit than 5 mR/hr, keeping track of the second that is than 5 mR/hr, keeping track of the second the original vial. Of actor by multiplying all dilution 15:1. Record this information on the discarded or stored for directed. Cleaning and Securing the Hot Cell Cleaning Disposal of Radioactive Samp During these actions, the rearea and airborne concentrate may become higher since the discharged via the sink. a) Turn on sink drain fauo steady stream. 	 nkyhr, repeat steps a. through the above, driving clean 14 cc gas sample vials until the sample than 5 mR/hr, keeping track of the number of Place a label on the counting vial repeating as found on the original vial. Calculate the factor by multiplying all dilutions together 15:1. Record this information on the data si Inquire from supervision whether the original should be discarded or stored for future use directed. Cleaning and Securing the Hot Cell Cleaning Disposal of Radioactive Sample Residues During these actions, the radiation lev area and airborne concentrations within may become higher since the sample mate discharged via the sink. a) Turn on sink drain faucet to proviste steady stream.

SENTRY POST- SENTRY POST- LIQUID AND G	A PLANT UNIT NO(S) 1 AND 2 ACCIDENT SAMPLING SYSTEM AS SAMPLE HANDLING (NOT MEET THE 3-HOUR TIME LIMIT)	REVISION O DATE 7/17/84 PAGE 11 OF 15
	 b) Open receiver funnel drain va liquid resides down the drain 	lve to empty the
	 Flush the drain lines with ab using demin water twice, foll flushes and two more demin wa 	oout 20 ml flushes owed by two caustic iter flushes.
	 d) Open the access port on top on Remove sample caps using tong remote handling device, empty the flasks remaining in the e receiver flask drain. (Be ca the receiver flask drain). 	of the hot cell. is and, using the out the contents of enclosure down the reful not to overfill
	 Flush out the sample flasks a contaminated handling tools w caustic or acid wash solution followed by a demin water rin 	nd wash off all with demin water, s (as appropriate), se.
	 f) Perform a general washdown of remove contamination. Close finished inside the hot cell. 	the hot cell to the access port when
	g) Store sample flasks, vessels, materials not to be used a thoroughly cleaned and inspec	etc. as "dirty" gain unless ted.
2)	Disposal or Storage of Chemicals,	etc.
	 a) Dispose of waste chemicals, m similar fashion as above for vessels. (Of course the prec radioactivity should not app). 	aterials, etc. in a the radioactive autions regarding y).
	 b) Chemicals, reagents and other consumed or compromised durin may be stored for later use. in the cabinet space adjacent 	supplies not g the sample analyses These may be stored to the sink area.
b. Sec	uring Equipment	
1)	Valves	

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		a)	Verify t shielded lines ha clean.	the samp d sample ave been	le receiv enclosur thorough	er funnel e is valv ly flushe	within the ved shut after the and surveyed	e
		b)	Verify 1	that the	sink wat	er flow	is secured off.	
	2)	Vent	ilation					
		a)	If the f secured duct may require	hot cell , the ve y be tur ment for	and all ntilation ned off, this sys	survey/ac flow via provided tem.	ccess ports are the overhead there is no othe	r
	3)	When	ready to ting room	o do so, m for co	transfer unting.	samples	to the TSC or	
	4)	Turn unle	all ven ss the S	tilation entry Ro	OFF when	leaving e used in	the Sentry Room h the near future	
	5)	When pres	exiting sures of	through the gas	the Moto supply b	or Repair pottles.	Shop, note the	
			Argon			psig		
			Cal Gas	1		_psig		
			Cal Gas	2		_psig		
•	6)	Clos gass	e the bo es.	ttle iso	lation va	lves for	the Sentry suppl	У

D.ABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 SENTRY POST-ACCIDENT SAMPLING SYSTEM LIQUID AND GAS SAMPLE HANDLING (NOT TITLE INTENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER REVISION DATE PAGE	EP R 0 7/17, 13 (B-16:E /84 DF 15
APPENDIX 1			
. CHECKLIST OF REQUIRED EQUIPMENT AND SUPPLI	ES		
PERSONNEL PROTECTION AND EVALUATION (PRIOR TO PLANT ENTRY)		CH	HECK
			IL UN
Exposure rate survey equipment; 1 device/individual, includi	ng:		
1 teletector for Sentry Room use (as a minimum)		r	1
Balance comprised of teletectors, RO-2A's or equivalent	devices		
SCBA respirators; 1 device/individual		г	1
SCBA spare breathing air bottles; 3 bottles/individual (in S	entry Room)	ĩ	i
Fuil set of protective clothing with duct tape; 1 set/indivi	dual	ī	ĩ
Heavy rubber gloves (or two pair regular rubber gloves); 1 s	et per		<u></u>
individual		1	1
Normal and accident range dosimeters (pencil dosimeters and	TLD's);		
1 set/individual		[]
Extremity dosimeters for hands; 1 set/individual]]
Lapel air samplers (recommended); 1 sampler/individual		1]
Voice communication amplifier (compatible with mask); 1 unit,	/individual	[]
GENERAL SAMPLE HANDLING AND MANIPULATIONS (Sections 1, 2, and	<u>16)</u>		
Fully operable hot cell (located in Sentry Room)		ſ	1
Sample shield brick (with pre-bored holes)		ĩ	i
Long extension tongs: 14-16" in length, (2 pairs)		ī	1
RO-7 w/RO-7-BM probe and 5' cable		ī	1
Acid cleaning solution (1 gallon)		1	1
Caustic cleaning solution (1 gallon)		I	1
Demin water jug (5 gallons)		1]
Suction bulb]]
Rubber hose (5' long with trigger spray nozzle and tap hook-u	ip)	1	1

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DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 SENTRY POST-ACCIDENT SAMPLING SYSTEM LIQUID AND GAS SAMPLE HANDLING (NOT TITLE INTENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER EP RE REVISION O DATE 7/17/ PAGE 14 C	9-16:E 184 0F 15
APPENDIX 1 (Continued)		
GENERAL SAMPLE HANDLING AND MANIPULATIONS (Sections 1, 2, a)	nd 6) (Continued)	
GENERAL SHALLE MANDELING AND MANY DENTIONS (DECENTION 1) E)	<u></u> (
30 ml beakers (3)	1]
Paper towels or equivalent (1 box)	1]
Alcohol (1 liter)	ſ]
RADIOACTIVE SAMPLE DILUTION SUPPLIES (SECTION 3)	<u></u>	HECK
20 ml liquid scintillation vial w/cap (1)	L	1
Sealing tape for 20 ml liquid scintillation vial (1 roll)	L	1
Labels for 20 mi liquid scintiliation vial (1 box)	r	1
Small plastic bags; sealable (1 dozen)	r r	1
1 ml ninet w/tin	r	1
Adjustable 0-5 ml pipet w/tip	r	i
Shielded syringe (calibrated for 5 cc volume)	í I	i
Spare syringe cylinder	ť	ĵ
BORCN SAMPLE ANALYSIS SUPPLIES (SECTION 4)		
50 ml Erlenmeyer flasks w/rubber stoppers (4 sets)	I	3
1 cm path length spectrophotometer cells w/caps (3 sets)	C	3
Dri-wipes for spectrophotometer cells (1 box)	Ľ]
Rinse/soak bath for 1 cm path length spectrophotometer cell	s []
100 ml volumetric flask	ſ]
¹ Reagents <u>must</u> be stored in boron free containers; use plas	tic	
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APPENDIX 1 (Continued) BORON SAMPLE ANALYSIS SUPPLIES (SECTION 4) (Continued) Adjustable 0-5 ml pipets (2) w/tips (1) 10 µl pipet w/tips (3) Spectrophotometer unit Dilute nitric acid, HNO ₃ (bath) Carminic acid solution ¹ , Stability: 1 week (30 ml/analysis) Hydrochloric acid ¹ , HC1, concentrated (30 ml/analysis) Sulfuric acid ¹ , H ₂ SO ₄ , concentrated (30 ml/analysis) Standard boric acid solution ¹ , 200 ppm B, Stability: Restandard monthly (5 ml/analysis) DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5)	[] [] [] [] [] dize	
BORON SAMPLE ANALYSIS SUPPLIES (SECTION 4) (Continued) Adjustable 0-5 ml pipets (2) w/tips (1) 10 ul pipet w/tips (3) Spectrophotometer unit Dilute nitric acid, HNO ₃ (bath) Carminic acid solution ¹ , Stability: 1 week (30 ml/analysis) Hydrochloric acid ¹ , HCl. concentrated (30 ml/analysis) Sulfuric acid ¹ , H ₂ SO ₄ , concentrated (30 ml/analysis) Standard boric acid solution ¹ , 200 ppm B, Stability: Restandard monthly (5 ml/analysis) DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5)	[] [] [] [] [] [] dize	
Adjustable 0-5 ml pipets (2) w/tips (1) 10 µl pipet w/tips (3) Spectrophotometer unit Dilute nitric acid, HNO ₃ (bath) Carminic acid solution ¹ , Stability: 1 week (30 ml/analysis) Hydrochloric acid ¹ , HCl, concentrated (30 ml/analysis) Sulfuric acid ¹ , H ₂ SO ₄ , concentrated (30 ml/analysis) Standard boric acid solution ¹ , 200 ppm B, Stability: Restandard monthly (5 ml/analysis) DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5)	[] [] [] [] [] dize	
<pre>10 µl pipet w/tips (3) Spectrophotometer unit Dilute nitric acid, HNO₃ (bath) Carminic acid solution¹, Stability: 1 week (30 ml/analysis) Hydrochloric acid¹, HCl, concentrated (30 ml/analysis) Sulfuric acid¹, H₂SO₄, concentrated (30 ml/analysis) Standard boric acid solution¹, 200 ppm B, Stability: Restandard monthly (5 ml/analysis) DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5)</pre>	[] [] [] [] [] dize	
Spectrophotometer unit Dilute nitric acid, HNO ₃ (bath) Carminic acid solution ¹ , Stability: 1 week (30 ml/analysis) Hydrochloric acid ¹ , HCl, concentrated (30 ml/analysis) Sulfuric acid ¹ , H ₂ SO ₄ , concentrated (30 ml/analysis) Standard boric acid solution ¹ , 200 ppm B, Stability: Restandard monthly (5 ml/analysis) <u>DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5)</u>	[] [] [] [] dize	
Dilute nitric acid, HNO ₃ (bath) Carminic acid solution ¹ , Stability: 1 week (30 ml/analysis) Hydrochloric acid ¹ , HCl, concentrated (30 ml/analysis) Sulfuric acid ¹ , H ₂ SO ₄ , concentrated (30 ml/analysis) Standard boric acid solution ¹ , 200 ppm B, Stability: Restandard monthly (5 ml/analysis) DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5)	[] [] [] dize	
Carminic acid solution ¹ , Stability: 1 week (30 ml/analysis) Hydrochloric acid ¹ , HCl, concentrated (30 ml/analysis) Sulfuric acid ¹ , H ₂ SO ₄ , concentrated (30 ml/analysis) Standard boric acid solution ¹ , 200 ppm B, Stability: Restandard monthly (5 ml/analysis) <u>DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5)</u>	[] [] dize	
Hydrochloric acid ¹ , HCl, concentrated (30 ml/analysis) Sulfuric acid ¹ , H ₂ SO ₄ , concentrated (30 ml/analysis) Standard boric acid solution ¹ , 200 ppm B, Stability: Restandard monthly (5 ml/analysis) <u>DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5)</u>	[] [] dize	
Sulfuric acid ¹ , H ₂ SO ₄ , concentrated (30 ml/analysis) Standard boric acid solution ¹ , 200 ppm B, Stability: Restandard monthly (5 ml/analysis) <u>DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5)</u>	[] dize	
Standard boric acid solution ¹ , 200 ppm B, Stability: Restandar monthly (5 ml/analysis) DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5)	dize	
DILUTION OF OFF-GAS FOR ISOTOPIC ANALYSIS (SECTION 5)		
	CHECK	ć
14 cc gas sample vials w/septums installed (2)	r 1	
5 cc gas tight syringe/needle	r i	
Labels for 14 cc gas vials	r i	
Small plastic bags; sealable	r i	
Sealing tape	Č J	
CONTAINMENT AIR FRACTIONATION SUPPLIES		
Spare U-tube filter assembly	[]	

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00	Pacific Gas and Electric Company	NUMBER REVISION	EP RB-16:F
An end of the second se	DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 EMERGENCY OPERATING PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM TITLE DATA ANALYSIS (NOT INTENDED TO MEET THE 3-HOUR TIME LIM	PAGE	1 OF 2
•	APPROVED <u>R. C. TArmbun</u> PLANT MANAGER	7-31-84 DATE	-
015	SCUSSION	IMPORTA IRONMEN	ANT TO
The dat for	purpose of this procedure is to provide a means to a generated from the various EP RB-16 sub-procedur rm.	o assemble t es into a co	he incise
PRO	DCEDURE		
1.	RCS stripped gas data are to be processed on Sectattached form.	tion (1) of	the
2.	Hydrogen data from containment atmosphere analysi Hydrogen Analyzer System are to be processed in S the attached form.	is by the in Section (2)a	situ) of
3.	Hydrogen data by Sentry Gas Chromatographic analy process on Section (2)b) of the attachment form.	sis are to	be
4.	Containment Air Isotopic Data are to be processed of the attached form.	on Section	(3)
5.	Analytical data for boron and/or chloride are to Section (4) of the attached form.	be process o	on
6.	Depressurized liquid isotopic data are to be proc (5) of the attached form.	essed on Sec	tion
7.	After filling in the pertinent sections of the at acquire approval signatures from the Chemistry and Protection Foreman and the Chemistry and Radiation Engineer.	tached form, d Radiation n Protection	, 1
8.	Attach all pertinent chemistry and radiochemistry form.	data to thi	S
	Doliver the semilated for the second		

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TITLE	SEN	TRY POST-ACCIDENT SAMPLING SYSTEM DATA ANALYSIS I INTENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER REVISION DATE PAGE	EP RB-16:F 0 7/19/84 2 OF 2
	ATT	ACHMENT		
	1.	Form 69-10862, Post Accident Liquid Sample Data S	heet, Rev.	7/84
	2.	Temperature Correction Table for pH		
	3.	Solubility of Oxygen in Air Saturated Water		

69/10862 7/84 (10)

PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2 Page 1 of 6

TITLE: POST ACCIDENT SAMPLE DATA SHEET (EP RB-16:F) DATE DAY ANALYST INITIALS (1). RCS Off-Gas Data (GAMMA ASSAY) P1 = Pressure Recorded on RC-G-2.1 (EP RB-16:B3, step 9.e.) ____psig P₂ = Pressure Recorded on RC-G-2.1 (EP RB-16:D, step 4.i.) psig Calculate the Gas Dilution Factor (DF): $DF_1 = \frac{V_1 (P_1 + 14.7)}{V_2 (P_2 + 14.7)} = \frac{A_1}{A_2}$, where A₁ = Initial activity isolated in sample line up to RC-V-15 (before GC analysis). $V_1 = System Volume (RC-EV-1 and lines to RC-V-15) = 360 cc$ P1 = Pressure Recorded Above A2 = Final Activity after GC analysis (the time at which the off-gas sample is collected). $V_2 = Volume of RC-DV-2 = 0.023 cc$ P₂ = Pressure Recorded Above Initial counting vial dilution factor = $11 = DF_2$ 11 NOTE: When the syringe is first injected into the 10 cc Sentry sample bottle and then the plunger is withdrawn to 1 cc (provided the syringe is still inserted in the 10 cc bottle), the total volume is 11 cc. If the sample is homogeneous, then the true dilution factor = 11, not 10. Subsequent dilution factor for 1 cc = 14 cc results in a multiplicative factor of 15 for each dilucion = DF_3 NOTE: The same argument used in the previous note applies here. The D.F. = 15, not 14. (Use 1 if no subsequent dilutions are made) Total dilution factor DF1 x DF2 x DF3 =
Page 2 of 6

TITLE: POST ACCIDENT SAMPLE DATA SHEET (EP RB-16:F)

DATE	ANALYST INITIALS	DAY	
(2)a) <u>Hydrogen Concent</u>	ration in Containment Air	r*	
. Hydrogen Analyze	r System		
Time switched from OFF to STANDEY (N/A if in STANDBY made fore this date)	<u>CEL-82</u>	<u>CEL-83</u>	
Scale Used (10% or 20%)			
Meter Reading (%)			
Time			
*Data from EP RB-16:A, Sect	tion 6		
DATE		DAY	
	ANALYST INITIALS		
(3)b) Hydrogen by Gas (Chromatography		
Loop Used (1, 2, 3, or 4)			_
Sample Time			
Standard Calibration Refere (from Calibration Sheet)	nce Pressure*		(psia)
Sampling Pressure, PS (EP R	B-16:1, Step 1.i.)*		(psia)
Peak Height, H (EP RB-16:D,	Step 4.n.)		(mm)
Peak Height Correction Fact From Calibration Sheet)	or + CF,		
corrected Peak Height, H _c =	$(H_c = H \times CF)$		(mm)
H2 (From Standard Calibra	tion Curve)		*
To convert to absolute pre- for pressure ≥ 0 : 14. or pressure ≤ 0 : 1.47 - (2)	ssure (psia): 7 + pressure reading (psi vacuum reading includes H	g) (g)	
Correction Factor for Pea	ak Height:		
Peak Height a Feak Hei	at Standard Calibration P ight at Sampling Pressure	ressure	

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TITLE: POST ACCIDENT SAMPLE DATA SHEET (EP RB-16:F)

	ANALYST INITIALS	DAY
(3) <u>Containment A</u>	ir Isotopic Analysis	
Containment Temper	ature, T _c (EP RB-16:C, Step 1.e.)	٥y
Sample Temperature	, T _s (EP RB-16:C, Step 2.e.)	^ ~ ^
Sample Collection	Time	^
Containment Noble (as.	
Fractional Yie	$1d = T_c / (43,400 \times T_c) = Y_{vc}$	
Noble Gas Acti	vity = µCi/cc	
Containment Air Iod	ine	
Fractional Yie	ld = T_/T_ =Y	
Iodine and Par	ticulate Activity = UCi	/cc
Counted By		,

where: Y_{IP} and Y_{NG} are fractional yields entered into the analysis program.

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TITLE: POST ACCIDENT SAMPLE DATA SHEET (EP RB-16:F)

DATE _		ANALYST INITIALS DAY	
(4) <u>Ch</u>	erica	1 Analysis	
. a)	Bor	ron	
		Concentration from analysis, B ppm	
		SYSTEM DILUTION FACTOR, DF, (usually 1000)	
		Corrected Concentration, C.C., (BxDF)	ppm
		Supplemental Dilution Factor S.D.F. (1 if no other chemistry dilutions are performed)	
		Final Corrected Concentration (C.C. x S.D.F.)	ppm
b)	Ch1	oride	
	Sta	ndard Check	
	Sta	ndard Peak Height (EP RB-16:G, Step 2.)	
	1.	ppm chloride	ppm (A)
	2.	in standard 2.n.	m m
	3.	ppm chloride from calibration curve 2.0.	ppm C1 ⁻
	4.	$\frac{(A-1.0)}{1.0} \times 100$	% Difference (B)
	5.	Is B. within ±10% (YES/NO)	?
		NOTE: 5. should be YES before proceeding with the	analysis.
	Sam	ple Analysis	
	1.	Sample peak height (EP RB-16:G, Step 4.i.)	mm

2. ppm Cl⁻ in Sample (EP RB-16:G, Step 4.j.) _____ ppm Cl⁻

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Page 5 of 6

TITLE: POST ACCIDENT SAMPLE DATA SHEET (EP RB-16:F)

DATE _	ANALYST INITIALS DAY	
(5) <u>Lie</u>	uid Isotopic Analysis	
	Initial Dilution Factor Additional Sample Dilution Factor (DF)	(DF1)
	(use 1 if there is no additional DF)	(DF2)
	Final Dilution Factor for Isotopic Analysis	2
	(DF1 × DF2)	(DF ₂)
	Fractional Yield to be entered into Isotopic Program 1/DF ₃	(Y)
DATE	ANALYST INITIALS DAY	
6) <u>p</u> H	Determination of Reactor Coolant	
(a)	First pH Calibration Data Point Temperature of Buffer Solution (EP RB-16:H, Step 1.a.6))	°C
	Temperature Corrected Buffer pH Value (See Attachment 2)	corrected
(b)	Second pH Calibration Data Point	
	 Temperature of Buffer Solution (EP RB-16:H, Step 1.a.16)) 	°C
	 Temperature Corrected Buffer pH Value (See Attachment 2) 	corrected
	 Temperature Corrected pH Measurement Recorded on pH Meter (Step 1.a. 17)) 	рн
	4. Accuracy = 6)(b)3 6)(b)-2.	
	5. Is 4. within ± 0.5 pH units (YES/NO)	?
(c)	Sample pH Measurement	
	1. pH Readout (EP RB-16:H, Step 3.f.)	рН
	Temp	°C

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Page 6 of 6

TITLE:		Contraction of the second s				
DATE _	ANALYST INITIALS DAY					
7) <u>De</u>	termination of Conductivity of Reactor Coolant					
. Co	nductivity Reading (EP RB-16:H, Step 3.b.)	umho				
Te	Temperature of Sample Stream (EP RB-16:H, Step 3.b.)					
DATE _	ANALYST INITIALS					
3) <u>De</u> a)	ermination of Dissolved Oxygen Concentration of Reactor (Coolant				
	Oxygen Standardization					
	Oxygen Standardization Temperature of the Recirculation Water (EP RB-16:H, Step 1.b.4))	°C				
	Oxygen Standardization Temperature of the Recirculation Water (EP RB-16:H, Step 1.b.4)) Accepted Concentration of O ₂ in Recirculation Steam (See Attachment 3)	°C °C				
Þ)	Oxygen Standardization Temperature of the Recirculation Water (EP RB-16:H, Step 1.b.4)) Accepted Concentration of O ₂ in Recirculation Steam (See Attachment 3) Sample Analysis	°C ppm 02				

Reviewed by _____ Foreman _____

Chemistry and Radiation Protection Engineer

PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

ATTACHMENT 1

TEMP°C	CORR	TEMP°C	CORR
16	31	31	+.20
17	27	32	+.24
18	24	33	+.26
19	20	34	+.29
20	16	35	+.32
21	13	36	+.36
22	10	37	+.40
23	07	38	+.43
24	03	39	+.46
25	.00	40	+.50
26	+.04	41	+.53
27	+.07	42	+.56
28	+.10	43	+.59
29	+.14	44	+.63
30	+.17	45	+ 66

TITLE: PH TEMPERATURE CORRECTION TABLES

BUFFER pH TEMPERATURE CORRECTION TABLE

	RED	GREEN	BLUE
TEMP	pH4	<u>pH7</u>	<u>pH10</u>
10°C	4.00	7.06	10 18
15°C		7.00	10.12
	4 00	7.02	10.12
20 0	4.00	7.02	10.06
25-6	4.00	7.00	10.01
30°C	4.01	6.99	9.97
35°C			9,93
40°C	4.03	6,98	9.89
45°C			9.86
50°C	4.06	6 97	9.83
50°C	4 00	6 00	9.05
2000	4.05	0.90	
10-0	4.12	6.99	
80°C	4.16	7.00	
90°C	4.19	7.02	
95°C	4.21	7.03	

*TAKEN FROM LABELS ON BECKMAN BUFFERS

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Page 1 of 1

PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

TITLE: SOLUBILITY at 1 atm.)	OF	OXYGEN	IN	AIR	SATURATED	WATER	(For	0×ygen	in A	ir
---------------------------------	----	--------	----	-----	-----------	-------	------	--------	------	----

ATTACHMENT 3

°C	PPM DISSOLVED OXYGEN	TEMP °C	PPM DISSOLVED OXYGEN
16	9.9	31	7.5
17	9.7	32	7.4
18	9.5	33	7.3
19	9.3	34	7.2
20	9.2	35	7.1
21	9.0	36	7.0
22	8.8	37	6.8
23	8.7	38	6.7
24	8.5	39	6.6
25	8.4	40	6.5
26	8.2	41	6.4
27	8.1	42	6.3
28	7.9	43	6.2
29	7.8	44	6.1
30	7.7	45	6.0

7/84

PC	Pacific Gas and Electric Company	NUMBER EP RB-16:G
~		REVISION O
11111	DEPARTMENT OF NUCLEAR PLANT OPERATIONS	DATE 7/19/84
U	DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 EMERGENCY OPERATING PROCEDURE SENTRY POST-ACCIDENT SAMELING SYSTEM TITLE ION CHROMATOGRAPHIC CHLORIDE ANALYSIS (NOT INTENDED TO MEET THE 3-HOUR TIME LIM)	PAGE 1 OF 10
•	APPROVED R.C. Thomber PLANT MANAGER	7-31-84 DATE
DI	ENVIE	IMPORTANT TO
ste CAF and	s purpose of this procedure is to detail the steps r isure chloride concentrations of reactor coolant. I ps to complete flushing of both the LSP reactor coo lines. This procedure requires operator actions a I CMP.	equired to included are lant module and t the LSP, CAP,
PRE	REQUISITES	
1.	The Ion Chromatograph (IC) was turned on accordin EP RB-16:A and has warmed up for 30 minutes.	g to Procedure
2.	CAP, CMP, and LSP systems lined up as detailed in RB-16:A.	Procedure EP
3.	Verify that the following annunciator windows are	off on the PCP:
	a. REACTOR COOLANT SAMPLE COOLING WATER LOW FLOW	W
	b. REACTOR COOLANT SAMPLE COOLING WATER LOW PRES	SS
	C. REACTOR COOLANT SAMPLE COOLING WATER HIGH TEM	1P
	d. REACTOR COOLANT PURGE HIGH TEMP	
	e. REACTOR COOLANT SAMPLE HIGH TEMP	
	f. LIQUID SAMPLE PANEL HIGH PLENUM PRESS	
	9. CHEM ANALYSIS PANEL HIGH PLENUM PRESS	
4.	The following equipment should be available:	
	a. Meter-long reach rod	
PREC	AUTIONS	
1.	This sampling involves processing of water that ma radioactive. Precautions should be taken to preve	y be highly

DIABLO	SI	YON PO ENTRY - ION C NOT IN	WER PLANT UNIT NO(S) 1 AND 2 POST-ACCIDENT SAMPLING SYSTEM HROMATOGRAPHIC CHLORIDE ANALYSIS TENDED TO MEET THE 3-HOUR TIME LIMIT)	EP RB-16:G ON 0 7/19/84 2 OF 10
	2.	Time perf it m cons	in a radiation field should be limited to that necess orm the required operations. During purge and flush p ay not be necessary to stand near the panels and ideration should be given to moving to a low dose area	ary to eriods,
	3.	A do sugg	se rate instrument should be on and periodic monitoring ested during purge and sampling exercises.	g is
	4.	For	the Ion Chromatograph (IC):	
		a.	The calibration curve should be checked once every 4 s by analyzing a chloride standard.	samples
		ь.	Calibration should be checked when first using a new e	eluent.
		c.	Regeneration is required about once every 4 hours of continuous operation. Refer to the troubleshooting an surveillance and maintenance procedure.	nd
		d.	During continuous operation, the separator column must cleaned on a daily basis or every other regeneration to pumping 0.006M sodium carbonate (Eluent 1) through the column for a minimum of 10 minutes, followed by a 20 m demineralized water rinse. This may be coincident with regeneration of the suppressor column. Refer to the troubleshooting and surveillance and maintenance proce	t be by ninute th edure.
	PROC	EDURE		
	1.	Inst	rument Calibration	
		NOTE	If analysis is required from a second sample source, monitor calibration is not needed again. Proceed to 2. LSP and CAP Purging.	, then step
		a.	Set the OFFSET range switch to left.	[]
		b.	Adjust the COARSE vernier switch to zero the meter. It may be necessary to adjust the FINE pot to zero the meter.	[]
		с.	Operate the system until the baseline is stabilized with the umho FULL SCALE switch in the 1 position adjusting the FINE pot as	

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DIABLO CA TITLE	NYON ENTRY - ION NOT I	POWER PLANT UNIT NO(S) 1 AND 2 POST-ACCIDENT SAMPLING SYSTEM CHROMATUGRAPHIC CHLORIDE ANALYSIS NTENDED TO MEET THE 3-HOUR TIME LIMPT)	NUMBER EP RB-16:G REVISION O DATE 7/19/84 PAGE 3 OF 10
2.	Ch1	oride Standard Check	
	a.	Close or check closed CAP-V-15.	[]
	b.	Verify CAP-CAL-3 is at least half full. (STP G-15, Section 8, directs filling).	LJ
	c.	Set MODE switch to LIN and bring the conductivi meter needle on scale with the COARSE OFFSET or FINE control. Set the needle to 0 on the scale	ty . []
	d.	Align CAP-V-5 to CHLORIDE CALIB. SOL'N.	[]
	e.	Open CAP-V-15.	[]
	f.	Turn on the L&N recorder.	[]
	g.	After 1 minute, place the LOAD/INJECT switch at the CMP to INJECT and mark the recorder trace date, time, injection point, analyst's initials sample type, and conductivity meter setting.	with []
	h.	After 1 minute, place the LOAD/INJECT switch in LOAD position.	
		NOTE: The Cl ⁻ peak will elute about 5 min. after injection.	er
	i.	Close CAP-V-15.	[]
	j.	Align CAP-V-5 Counterclockwise to CLOSED.	[]
	k.	Align CAP-V-29 to vent (6 o'clock)	[]
	1.	After the Cl ⁻ peak has eluted, wait 5 minutes then shut off the L&N recorder.	[]

ABLO CANY	NTRY	WER PLANT UNIT NO(S) 1 AND 2 POST-ACCIDENT SAMPLING SYSTEM HROMATOGRAPHIC CHLORIDE ANALYSIS TENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER EP RB-16:G REVISION O DATE 7/19/84 PAGE 4 OF 10
	т.	Align CAP-V-5 to RCS sample (9 o'clock).	[]
	n.	Determine the peak height:	
		Peak height = (Trace Peak Height - Baseline) x	Attentuation
		Peak Height =	mm
		Corresponding ppm Cl ⁻ from CAL. Curve	ppm (A)
	0.	Compare the Cl standard peak with the calibrat For the same umho setting, the values should be	tion curve. e within ±10%.
		$\frac{(A) - 1.0}{1.0} \times 100 = \%$ Difference	e (B)
		Is (B) within ±10%? (YES/NO)	
3.	LSP	and CAP Purging	
	a.	Open RC-SV-1 and RC-SV-2 by placing BKR #10 to position at breaker panel PYNM11.	the ON []
	b.	Open the following valves:	
		RC-V-7 [] RC-V-3 []	
	c.	Position RC-V-22 to the TO CHEM PANEL position.	[]
	d.	Open the remote flush isolation valve at the PC (see Attachment 1 for proper valve.) Open the remote flush isolation valve then allow the sam to recirculate for 5 minutes. Close the remote flush isolation valve.	ple []
	NOTE	The sample source valves are labeled RC-V-1.1 through RC-V-1.5. Throughout this procedure the form RC-V-1.X will be used to indicate th source valve to be operated. The sample sour used for sampling should have been given at the briefing by the site Chem and Rad Protection Coordinator.	l ne ce che

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DIABLO C	ANYON PO	DWER PLANT UNIT NO(S) 1 AND 2 NU RE DA POST-ACCIDENT SAMPLING SYSTEM	MBER EP RE-16:G VISION O TE 7/19/84 GE 5 OF 10
TITLE	ION ((<u>NOT</u> IN	CHROMATOGRAPHIC CHLORIDE ANALYSIS WTENDED TO MEET THE 3-HOUR TIME LIMIT)	
	e.	Open RC-V-1.X (see Attachment 1 for proper valve)	. []
	f.	Open RC-VREL-1 until RC-FI-1 indicates 100% full Purge for 5 minutes.	flow.
	NOTE	: Sample will now be flowing into the back of the LSP. The meter-long reach rod should be used to operate valves and a dose rate survey should be done to monitor radiation levels.	
	g.	Slowly close RC-VREL-1 until RC-FI-1 indicates abo 45% full flow. Continue the purge for 1 minute.	out []
	h.	Close RC-V-3.	[]
	i.	Open RC-V-2.	[]
	j.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% full flow.	[]
	j.	Verify that the red FULL FLOW lights are lit for t ION CHROMAT loop at the CMP and CAP panels. Adjus RC-VREL-2 if necessary to obtain proper flow rate.	t []
	k.	Continue the purge for 5 minutes.	[]
4.	Samp	le Analysis	
	a.	At the CMP, activate the L&N recorder.	[]
	b.	Place the IC LOAD/INJECT switch in the INJECT posi and mark the inject position on the chart paper.	tion []
	c.	On the chart paper, record the date/time, sample source used, umho setting, chart speed, and analyst's initials.	[]
	d.	After approximately 1 minute from sample injection place the LOAD/INJECT switch in the LOAD position.	· []
	NOTE :	The chloride peak will appear approximately 5 minutes after injection at the same retention time observed for the standard.	
	e.	Turn CAP-V-5 to the DEMIN WATER position.	[]

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DIABLO	NUMBER EP RB-16:G REVISION O DATE 7/19/84		
TITLE	SENTRY ION ((NOT I)	POST-ACCIDENT SAMPLING SYSTEM CHROMATOGRAPHIC CHLORIDE ANALYSIS NTENDED TO MEET THE 3-HOUR TIME LIMIT)	PAGE 6 OF 10
	f.	Flush with demin water for 2 minutes.	[]
•	g.	Examine the L&N recorder. If the chloride per goes off-scale, a reanalysis must be complete using a larger umho setting (3 umho) and foll the steps below, otherwise skip to step "h".	ak d owing []
	-	1) Select appropriate attenuation.	[]
		2) Align CAP-V-5 to LIQUID SAMPLE.	[]
		3) Continue the purge for 1 minute.	[]
		 Place LOAD/INJECT switch in the INJECT p and mark the inject position on the char 	osition t paper. []
		 On the chart paper, record the date/time source used, umho setting, chart speed, analyst's initials. 	, sample and []
		 After approximately 1 minute, place the LOAD/INJECT switch in the LOAD position. 	[]
		NOTE: The chloride peak will appear at appro 5 minutes after injection.	ximately
		7) Turn CAP-V-5 to the DEMIN WATER position	. []
		8) Flush with demin water for 2 minutes.	[]
		9) Examine the L&N recorder for the chlorid	le peak. []
		NOTE: If the chloride peak is off scale, cha umho setting and repeat step g. until chloride peak is on scale.	nge the the
	h.	After the Cl ⁻ peak has eluted, wait 5 minutes then turn off the L&N recorder.	[]
	i.	Determine the peak height	
		Peak height = (Trace peak height - baseline)	x attentuation
		Peak heig	ht = mm

DIABLO	CANYON	POWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-16:G REVISION O DATE 7/19/84
TITLE	SENTRY ION (NOT 1	Y POST-ACCIDENT SAMPLING SYSTEM CHROMATOGRAPHIC CHLORIDE ANALYSIS INTENDED TO MEET THE 3-HOUR TIME LIMIT)	PAGE 7 OF 10
	j.	Determine the ppm chloride from the calibration and record on the data sheet (EP RB-16:F).	n curve
5	. Flu	shing	
	а.	At the PCP, perform the following:	
		 Close the remote plant and source isolatic valves. (see Attachment 1). 	n []
		 Open the remote flush isolation valve (see Attachment 1 for proper valve). 	[]
	b.	At the LSP, close RC-V-1.X.	[]
	с.	At the CAP, align CAP-V-5 to LIQUID SAMPLE.	[]
	d.	At the LSP, open RC-V-4.	[]
	e.	Open RC-VREL-2 until RC-FI-2 indicates 100% of full flow. Flush with demin water for 3 minute	s. []
	f.	Close RC-V-7.	[]
	g.	Open RC-V-3.	[]
	h.	Adjust RC-VREL-1 until RC-FI-1 indicates 100% of full flow. Flush with demin water for 1 minute	f []
	1.	Close RC-V-3.	[]
	j.	Open RC-V-1.X and flush with demin water for 5 minutes.	[]
	k.	Close RC-V-1.X.	[]
	1.	Open RC-V-7.	[]
	m.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% of full flow. Flush with demin water for 3 minutes	. []
	n.	At the CMP, cycle the LOAD/INJECT switch at leas 3 times. Return it to the LOAD position.	t []
	0.	At the CAP, align CAP-V-5 to CLOSED.	[]

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DIABLO CAN	YON POWER PLA NIT NO(S) 1 AND 2 NUMBER PLA NIT NO(S) 1 AND 2 REVIS DATE	R EP RB-16:G ION O 7/19/84
	NTRY POST-ACCIDENT SAMPLING SYSTEM PAGE ION CHROMATOGRAPHIC CHLORIDE ANALYSIS OT INTENDED TO MEET THE 3-HOUR TIME LIMIT)	8 OF 10
	p. Turn CAP-V-6 to LIQUID SAMPLE (9 o'clock) and flush with demin water for 2 minutes.	[]
	q. Turn CAP-V-6 to OXYGEN CALIB SOLUTION.	[]
	r. Close CAP-V-11.	[]
	s. Terminate flushing by closing the following valves:	
	RC-V-7 [] RC-V-2 [] RC-V-4 [] RC-VREL-1 [] RC-VREL-2 []	
	t. Align RC-V-22 to WASTE.	[]
	u. At the PCP, close the remote flush isolation valve.	[]
	v. At breaker panel PYNM11, place BKR #10 to the OFF position.	[]
	w. Call the control room and have operations close the containment isolation valves opened earlier.	[]
6.	Flushing the Separator and Suppressor Columns	
	If the IC is not needed for further sampling in an 8 hour period then the following steps should be performed before system shutdown can be started.	e
	 Perform the following IC valve alignments to wash the iodine and other cations from the suppressor column: 	
	<u>NOTE</u> : Direction from the Site Emergency Coordinator may preclude this section, if radiological conditions warrant.	
	 Check that the conductivity meter mode switch is set to ZERO. 	[]
	2) In the eluent/pump enclosure of the CAP, check the following:	

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DIABLO	CANYON POWER SENTRY POST	PLANT	UNIT NO(S)	1 AND 2		NUMBER REVISI DATE PAGE	R EP RB-16:G ION 0 7/19/84 9 OF 10
TITLE	ION_CHROM (<u>NOT</u> INTEND	ATOGRA	MEET THE 3-H	E ANALYSIS DUR TIME LIMIT)			
		a)	Check the le regenerants	evels of eluent are at least h	, water, a alf full.	Ind	[]
		b)	Check that the is visible in	the I.C. pumps in the sightgla	and vent i ss or tubi	f air ng.	[]
		c)	Check that t set at 40% f	the pump stroke for both pumps.	settings	are	[]
	3)	At t	he CMP, check	the following	:		
		a)	Check that t thumbwheels and 45 min f	the regeneration are set at 15 m for RIN.	n time min for RE	G	[]
		b)	Align the fo the indicate	llowing air tog d positions:	ggle switc	hes to	
			E1	E1	[]		
			E2	DOWN	[]		
			SEP-1	SEP-1	[]		
			SUP-1/RGN-2	SUP-2/RGN-1	[]		
			INJECT/LOAD	LOAD	[]		
	4)	Depre suppr reger	ess regenerat ressor column merated.	ion START butto will automatic	on and the ally be		[]
	5)	Flush min., the s	the separate turn the E	or column for 2 switch to DOWN umn with demin.	20 min. At and rinse water for	fter 20	
		10 mi	n.				[]

DIABLO CANY	NTRY	DWER PLANT UNIT NO(S) 1 AND 2 POST-ACCIDENT SAMPLING SYSTEM HROMATOGRAPHIC CHLORIDE ANALYSIS TENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER EP RB-16:G REVISION O DATE 7/19/84 PAGE 10 OF 10
7.	Syst	em Shutdown	
	ê.	After completion of column regeneration, perfo following:	orm the
		1) Turn IC POWER switch to OFF.	[]
		2) Turn AIR switch to OFF.	[]
		3) Turn GAUGE switch to OFF.	[]
		4) Turn ELUENT pump switch to OFF.	[]
		5) Turn conductivity meter MODE switch to Z	ERO. []
٤.	Data	Analysis	
	a.	Proceed to EP RB-16:F for data analysis	
REFER	RENCES	5	
1	Senti	ry Fouinment Corn High Padiation Sampling Syst	tem Operating

 Sentry Equipment Corp. High Radiation Sampling System Operating and Maintenance Manual.

ATTACHMENTS

1. Valves for Obtaining Samples from Reactor Coolant

PACIFIC GAS AND ELECTRIC COMPANY Page 1 of 1 DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

TITLE: VALVES FOR OBTAINING SAMPLES FROM REACTOR COOLANT

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ATTACHMENT 1

SAMPLE SOURCE	REMOTE PLANT ISOLATION VALVE (RPIV)	REMOTE SOURCE ISOLATION VALVE (RSIV)	REMOVE FLUSH ISOLATION VALVE (RFIV)	LSP SAMPLE SOURCE VALVE (SSV)
RC Hot Leg 1	FCV-9351 A	FCV-692	FCV-1416	RC-V-1.1
RC Hot Leg 4	FCV-9351 B	FCV-692	FCV-1416	RC-V-1.1
PZR Liquid	FCV-9350 B	FCV-693	FCV-1417	RC-V-1.2
PZR Steam	FCV-9350 A	FCV-694	FCV-1418	RC-V-1.3
RHR Pump 1-1 Discharge	FCV-9353 A	FCV-1413	FCV-1419	RC-V-1.4
KHR Pump 1-2 Discharge	FCV-9353 B	FCV-1413	FCV-1419	RC-V-1.4
VCT Liquid	N/A	FCV-1412	FCV-1420	RC-V-1.5

PG	-	Pacific Gas and Electric Compa	NUMBER EP RB-16: REVISION O
n	DEPA	ATMENT OF NUCLEAR PLANT OPERATIONS	DATE 7/20/84
	DIABL	O CANYON POWER PLANT UNIT NO(S) 1 EMERGENCY OPERATING PROCEDURE SENTRY POST-ACCIDENT SAMPLING SY PH/CONDUCTIVITY/YSI DISSOLVED (NOT INTENDED TO MEET THE 3-HOUR	AND 2 PAGE 1 OF 8 (STEM O OXYGEN R TIME LIMIT)
•	APPR	DVED R. C. Thomas PLANT MANAG	7-31-84 DATE
DIS	CUSSI	<u>IN</u>	IMPORTANT TO ENVIRONMENTAL QUALITY
The mea rea LSP ope	purpo sure p ctor o react rator	ese of this procedure is to detail t bH, conductivity, and dissolved oxyg coolant. Included are steps to comp for coolant module an CAP lines. Th actions at the LSP, CAP, and CMP.	he steps required to en concentrations of lete flushing of both the is procedure requires
PREI	REQUIS	ITES	
1.	Moni	tors are turned on according to prov	cedure EP RB-16:A:
	a.	and have warmed up for 1 hour if or been calibrated within 1 week;	xygen analyzer has not
	b.	or, have warmed up for 30 minutes not need calibration.	if oxygen analyzer does
2.	CAP, EP R	CMP, and LSP systems lined up as de B-16:A.	etailed in procedure
3.	Veri	fy that the following annunciator wi	indows are off on the PCP:
	a.	REACTOR COOLANT SAMPLE COOLING WATE	ER LOW FLOW
	b.	REACTOR COOLANT SAMPLE COOLING WATE	ER LOW PRESS
	с.	REACTOR COOLANT SAMPLE COOLING WATE	R HIGH TEMP
	d.	REACTOR COOLANT PURGE HIGH TEMP	
	e.	REACTOR COOLANT SAMPLE HIGH TEMP	
	f.	LIQUID SAMPLE PANEL HIGH PLENUM PRE	SS
	g.	CHEM ANALYSIS PANEL HIGH PLENUM PRE	22

DC0128 11V

TITLE	SEN	TRY POST-ACCIDENT SAMPLING SYSTEM PH/CONDUCTIVITY/YSI DISSOLVED OXYGEN I INTENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER EP RB-16:H REVISION O DATE 7/20/84 PAGE 2 OF 8
	4.	The following equipment must be available:	
		a. Meter-long reach rod	
		b. Small screwdriver	
	5.	The conductivity meter should have been calibrated last 3 months.	within the
	PRE	CAUTIONS	
	1.	This sampling involves processing of water that wirradioactive. Precautions should be taken to preven or ingestion.	ll be highly nt skin contact
	2.	Time in a radiation field should be limited to that perform the required operations. During purge and it may not be necessary to stand near the panels ar consideration should be given to moving to a low do	t necessary to flush periods, nd ose area.
	3.	A dose rate instrument should be on and periodic mo suggested during purge and sampling exercises.	nitoring is
	PROC	EDURE	
	1.	Monitor Calibration	
		<u>NOTE</u> : If analysis is required from a second sample monitor calibration is not needed again. Pr 2. LSP and CAP Purging	source, then oceed to step
		a. pH Calibration	
		1) Align CAP-V-6 to pH CALIB SOLUTION	[]
		 Adjust CAP-V-26 until sufficient flow is indicated by red flow indicator light. Flow for 2 minutes. Cycle CAP-V-7 to Rexn. and then back to the YSI Oxygen Analyzer. 	ard []
		 Turn CAP-V-6 <u>counterclockwise</u> to OXYGEN CALIB. SOLUTION to terminate flow. 	[]
		A) A1/ CAD U OD	

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ITLE	SENTRY POST-A	CCIDENT SAMPLING SYSTEM	0N 0 7/26/84 3 OF 8
	5)	Observe and record the temperature of the buffer solution as indicated on the CMP. Temp. °C	
•		a) Correct the buffer pH value for the recorded temp. from the pH Temperature Correction Table (Attachment 1).	[]
	6)	Adjust the pH monitor R-3 until the meter indicates the temperature corrected pH value.	[]
	7)	Observe the pH monitor reading for 2 minutes and adjust if drift exceeds ±0.1 pH units. pH	
	8)	Align CAP-V-6 to DEMIN WATER and flush for 2 minutes.	[]
	9)	Align CAP-V-30 to pH calibration tank CAL-2.	[]
	10)	Align CAP-V-28 to the nitrogen supply line.	[]
	11)	Align CAP-V-6 to the pH CALIB SOLUTION.	[]
	12)	Align CAP-V-16 until the red flow indicator is lit. Flow for 2 minutes. Cycle CAP-V-7 to Rexnard and then back to YSI Oxygen Analyzer.	[]
	13)	Turn CAP-V-6 counterclockwise to the OXYGEN CALIB SOLUTION to terminate flow.	[]
	14)	Align CAP-V-28 to vent position.	[]
	15)	Observe and record the temperature of the buffer solution as indicated on the CMP.	
		Temp°C	
		 a) Correct the buffer pH valve for the recorded temp. from the pH Temperature Correction Tabl (Attachment 1). 	le []
	DC0128 31V		

TITLE	SENTRY P PH/CO (NOT INT	OST-AC	PLANT UNIT NO(S) 1 AND 2 CCIDENT SAMPLING SYSTEM (VITY/YSI DISSOLVED OXYGEN TO MEET THE 3-HOUR TIME LIMIT)	NUMBER EP RB-16:H REVISION O DATE 7/20/84 PAGE 4 OF 8
		16)	After the meter reading has stabiliz reading and compare to the temperatu value. The reading should be within the temperature corrected value.	ed, record the re corrected pH ±0.5 pH units of
			рн	
		17)	Align CAP-V-6 to DEMIN WATER and flu minutes.	sh for 2
	b.	Diss	olved Oxygen Analyzer Calibration	
		NOTE	: If calibration has been performed proceed to step 2. LSP and CAP Pur	within 1 week ging.
		1)	Open CAP-V-9.	[]
		2)	Align CAP-V-6 to OXYGEN CALIB SOLUTI	DN. []
		3)	Close CAP-V-17 until the red flow in is lit. Flow for 5 minutes.	dicator []
		4)	Read and record the temperature of t in CAL-4 at the CMP.	ne water
				Temp°C
		5)	Determine the dissolved oxygen conce from the Solubility of Oxygen in Air Water table (Attachment 2) and record	ntration Saturated d the value.
			ppm (fissolved oxygen
		6)	While flowing, adjust the O2 calibra until the pen traces to the dissolve concentration in ppm recorded in ste	tion knob d oxygen o 5). []
		7)	Turn the oxygen calibration pump to (DFF. []
		8)	Close CAP-V-9.	[]
		(9)	Align CAP-V-6 to LIQUID SAMPLE. (9 0	clock) []

DC0128 41V

DIABLO	CAN	YON PO	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-16:H REVISION O
TITLE	SENT	PAGE 5 OF 8		
	2.	LSP	and CAP Purging	
		a.	Open RC-SV-1 and RC-SV-2 by placing BKR #10 to the ON position at breaker panel PYNM11.	[]
		b.	Open the following valves:	
			RC-V-7 RC-V-3	
		c.	Position RC-V-22 to the TO CHEM PANEL positio	n. []
		d.	Close the remote flush isolation valve at the PCP (see Attachment 3 for proper valve).	[]
		NOTE	The sample source valves are labeled RC-V-1 RC-V-1.5. Throughout this procedure, the f RC-V-1.X will be used to indicate the source to be operated. The sample source used for will have been given at the briefing by the Chem and Rad Protection Coordinator.	.1 thru orm e valve sampling site
		e.	Open RC-V-1.X (see Attachment 3 for proper va	lve). []
		f.	Open RC-VREL-1 until RC-FI-1 indicates 100%. for 5 minutes.	Purge []
		NOTE	: Sample will now be flowing into the back of meter-long reach rod should be used to oper a dose rate survey should be done to monito levels.	the LSP. The ate valves and r radiation
		g.	Slowly close RC-VREL-1 until RC-FI-1 indicate Continue purge for 1 minute.	s 30%. []
		h.	Close RC-V-3. []	
		i.	Open RC-V-2. []	
		j.	Adjust RC-VREL-2 until RC-FI-2 indicates 100%	. []

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SENTRY POST-ACCIDENT SAMPLING SYSTEM PAGE 6 OF TITLE PH/CONDUCTIVITY/YSI DISSOLVED OXYGEN (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT) PAGE 6 OF	8
 k. Verify that the red FULL FLOW lights are lit for the pH, O₂, and COND loop at the CMP and CAP panels. Adjust RC=VREL-2 if necessary to obtain proper flow rate. 	
 At the CMP, turn YSI CHART SPEED to RAPID and verify PEN INPUT is set to -02. 	
3. Sample Analysis	
 a. Flow for 5 minutes or until YSI trace is linear. Cycle CAP-V-7 to Rexnard for 30 seconds and back to YSI Oxygen Analyzer. 	
b. Observe and record conductivity meter reading and temperature of the sample stream from the CMP.	
Condumho Temp°C	
c. Turn CAP-V-6 <u>counterclockwise</u> to OXYGEN CALIB SOLUTION to terminate sample flow and permit pH reading to stabilize. []	
d. Turn YSI CHART SPEED to 1 and mark the chart paper with the date/time, 0, range, sample source, sample temperature, and operator's initials.	
e. Read the O2 from the traceppmO2	
f. Observe the pH meter for 1 minute to ensure the reading has stabilized. Record the pH reading.	
ph°C	
4. Flushing	
a. At the PCP, perform the following:	
1) Close the remote source isolation valve. []	
 Open the remote flush isolation valve (see Attachment 3 for proper valve). 	

DC0129 61V

DIABLO	CANYON P	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-16: REVISION O DATE 7/20/84 PAGE 7 OF 8
TITLE	- PH/CO	OST-ACCIDENT SAMPLING SYSTEM NDUCTIVITY/YSI DISSOLVED OXYGEN ENDED TO MEET THE 3-HOUR TIME LIMIT)	•
	b.	At the LSP, close RC-V-1.X.	[]
	с.	At the CAP, align and CAP-V-6 to LIQUID SAMPLE (9 o'clock)	. []
	d.	At the LSP, open RC-V-4.	[]
	e.	Open RC-VREL-2 until RC-FI-2 indicates 100% fl Flush with demin water for 1 minute.	ow. []
	f.	Close RC-V-7.	[]
	g.	Open RC-V-3	[]
	h.	Adjust RC-VREL-1 until RC-FI-1 indicates 100% flow. Flush with demin water for 1 minute.	[]
	i.	Close RC-V-3.	[]
	j.	Open RC-V-1.X and flush with demin water for 5 minutes.	[]
	k.	Close RC-V-1.X.	[]
	1.	Open RC-V-7.	[]
	m.	Adjust RC-VREL-2 until RC-FI-2 indicates 100% flow. Flush with demin water for 3 minutes.	[]
	n.	At the CAP, align CAP-V-6 to OXYGEN CALIB SOLUTION.	[]
	0.	Terminate flushing by closing the following val	lves:
		RC-V-7 RC-V-2 RC-V-4 RC-VREL-1 RC-VREL-2	
	p.	Align RC-V-22 to WASTE.	[]
	q.	At the PCP, close the remote flush isolation valve.	[]
	r.	At breaker panel PYNM11, place BKR #10 to the C position.	DFF []

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 S. Call the control room and have operations close the containment isolation values opened earlier. [] S. System Shutdown NOTE: If monitors are going to be used again for a different sample source, skip to step 6., Sample Calculations. a. pH Monitor 1) Turn switches S-3 and S-1 to the OFF position. [] b. Conductivity Monitor 1) Turn function select switch to ZERO position. [] c. YSI Monitor 1) Turn YSI POWER switch to OFF position. [] c. YSI Monitor 1) Turn YSI POWER switch to OFF position. [] d. Remove chart paper. [] 6. Sample Calculations a. Corruct the recorded sample pH for temperature from the pH Temperature Correction Table (Attachment 1). Temp. corrected pH	 S. Call the control room and have operations close the containment isolation valves opened earlier. System Shutdown NOTE: If monitors are going to be used again for a differe sample source, skip to step 6., Sample Calculations. a. pH Monitor Turn switches S-3 and S-1 to the OFF position. Conductivity Monitor Turn function select switch to ZERO position. Conductivity Monitor Turn YSI POWER switch to OFF position. Turn YSI POWER switch to OFF position. 8. Corruct the recorded sample pH for temperature from the pH Temperature Correction Table (Attachment 1). Temp. corrected pH	EP RB-15:H ON 0 7/2 6 /84 8 OF 8	
 5. System Shutdown NOTE: If monitors are going to be used again for a different sample source, skip to step 6., Sample Calculations. a. pH Monitor Turn switches S-3 and S-1 to the OFF position. Conductivity Monitor Turn function select switch to ZERO position. Turn function select switch to ZERO position. Turn YSI POWER switch to OFF position. Remove chart paper. 6. Sample Calculations Corr.ct the recorded sample pH for temperature from the pH Temperature Correction Table (Attachment 1). Temp. corrected pH	 System Shutdown NOTE: If monitors are going to be used again for a differe sample source, skip to step 6., Sample Calculations. a. pH Monitor	[]	
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 <u>REFERENCES</u> 1. Sentry Equipment Corp. High Radiation Sampling System Operating and Maintenance Manual. <u>ATTACHMENTS</u> 1. pH Temperature Correction Table 2. Solubility of Oxygen in Air Saturated Water 3. Valves for Obtaining Samples from Reactor Coolant 	 <u>REFERENCES</u> 1. Sentry Equipment Corp. High Radiation Sampling System Operation and Maintenance Manual. <u>ATTACHMENTS</u> 1. pH Temperature Correction Table 2. Solubility of Oxygen in Air Saturated Water 3. Valves for Obtaining Samples from Reactor Coolant 		
 Sentry Equipment Corp. High Radiation Sampling System Operating and Maintenance Manual. <u>ATTACHMENTS</u> pH Temperature Correction Table Solubility of Oxygen in Air Saturated Water Valves for Obtaining Samples from Reactor Coolant 	 Sentry Equipment Corp. High Radiation Sampling System Operation and Maintenance Manual. <u>ATTACHMENTS</u> pH Temperature Correction Table Solubility of Oxygen in Air Saturated Water Valves for Obtaining Samples from Reactor Coolant 		
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3. Valves for Obtaining Samples from Reactor Coolant	3. Valves for Obtaining Samples from Reactor Coolant		

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PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIAGLO CANYON POWER PLANT UNIT NOS. 1 AND 2

ATTACHMENT 1

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TEMPOR	0000		
IEMP-C	LOKK	TEMP°C	CORR
16	31	31	+.20
17	27	32	+.24
18	24	33	+.26
19	20	34	+.29
20	16	35	+.32
21	13	36	+.36
22	10	37	+.40
23	07	38	+.43
24	03	39	+.46
25	.00	40	+.50
26	+.04	41	+.53
27	+.07	42	+.56
28	+.10	43	+.59
29	+.14	44	+.63
30	+.17	45	+ 66

TITLE: PH TEMPERATURE CORRECTION TABLES

BUFFER PH TEMPERATURE CORRECTION TABLE

TEMP	RED pH4	GREEN pH7	BLUE pH10
10°C	4.00	7.06	10.18
15°C			10.12
20°C	4.00	7.02	10.06
25°C	4.00	7.00	10.01
30°C	4.01	6,99	9.97
35°C			9 93
40°C	4.03	6.98	9.89
45°C			9.86
50°C	4.06	6,97	9.83
60°C	4.09	6,98	5.05
70°C	4.12	6,99	
80°C	4.16	7.00	
90°C	4.19	7.02	
95°C	4.21	7.03	

*TAKEN FROM LABELS ON BECKMAN BUFFERS

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PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

Page 1 of 1

	(For Oxyge	n in Air at .	l atm.)	
		ATTACHMEN	NT 2	
TEMP °C	PPM DISSOLVED OXYGEN	TEMP °C	PPM DISSOLVED DXYGEN	
15	9.9	31	7.5	
17	9.7	32	7.4	
18	9.5	33	7.3	
19	9.3	34	7.2	
20	9.2	35	7.1	
21	9.0	36	7.0	
22	8.8	37	6.8	
23	8.7	38	6.7	
24	8.5	39	6.6	
25	8.4	40	6.5	
26	8.2	41	6.4	
27	8.1	42	6.3	
28	7.9	43	6.2	
29	7.8	44	6.1	
30	7.7	5	6.0	

TITLE: SOLUBILITY OF OXYGEN IN AIR SATURATED WATER (For Oxygen in Air at 1 atm.)

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PACIFIC GAS AND ELECTRIC COMPANY DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2

TITLE: VALVES FOR OBTAINING SAMPLES FROM REACTOR COOLANT

ATTACHMENT 3

SAMPLE SOURCE	REMOTE PLANT ISOLATION VALVE (RPIV)	REMOTE SOURCE ISOLATION VALVE (RSIV)	REMOTE FLUSH ISOLATION VALVE (RFIV)	LSP SAMPLE SOURCE VALVE (SSV)
RC Hot Leg 1	9351 A	FCV-692	FCV-1416	RC-V-1.1
RC Hot Leg 4	9351 B	FCV-692	FCV-1416	RC-V-1.1
PZR Liquid	9350 B	FCV-693	FCV-1417	RC-V-1.2
PZR Steam	9350 A	FCV-694	FCV-1418	RC-V-1.3
RHR Pump 1-1				
Discharge	9353 A	FCV-1413	FCV-1419	RC-V-1.4
RHR Pump 1-2				
Discharge	9353 B	FCV-1413	FCV-1419	RC-V-1.4
VCT Liquid	N/A	FCV-1412	FCV-1420	RC-V-1.5

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PG	DEPARTMENT OF NUCLEAR PLANT OPERATIONS DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2 EMERGENCY OPERATING PROCEDURE SENTRY POST-ACCIDENT SAMPLING SYSTEM TITLE UNDILUTED CONTAINMENT AIR SAMPLING	NUMBER EP RB-16:I REVISION O DATE 7/2 6 /84 PAGE 1 OF 5
-	APPROVED R. C. THE 3-HOUR TIME L	.IMIT) <u>7-31-84</u> DATE
DIS	CUSSION	IMPORTANT TO RONMENTAL QUALITY
The obt gro	purpose of this procedure is to detail the step ain an undiluted containment air sample in a car ss isotopic analysis.	s required to t/cask assembly for
Com and	plete system flushing will be done at the comple the valve line up will be returned to the initi	tion of sampling al line up.
PRE	REQUISITES	
1.	System was initially lined up as described in EP RB-16:A.	procedure
2.	Verify that the following annunciator window i and CCP.	s off on the PCP
	a. CONTAINMENT AIR SAMPLE PANEL HIGH PLENUM	PRESS.
3.	The following equipment must be available and	operational:
	a. Meter-long reach rod.	
	b. 4 Channel MBIS Pressure Monitor (CASP-PI-	1109)
PREC	CAUTIONS	
1.	This sampling involves processing of containment highly radioactive. Precautions should be take releases to the sampling environment.	nt air that will be en to prevent
2.	Time in a radiation field should be limited to perform the required operations. During purge it may not be necessary to stand near the panel consideration should be given to moving to a lo	that necessary to and flush periods, ls and ow dose rate area.
3.	A dose rate instrument should be on and periodi suggested during purge and sampling exercises.	ic monitoring is

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DIABLO	SEN	YON P	OWER PLANT UNIT NO(S) 1 AND 2 OST-ACCIDENT SAMPLING SYSTEM UTED CONTAINMENT AIR SAMPLING ENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER EP RB-16:I PEVISION O DATE 7/2 0 /84 PAGE 2 OF 5				
	PROCEDURE							
	1.	Auto	omatic Undiluted Sampling of Containment Air In t/Cask	nto The				
		a.	Ensure that a cart/cask is engaged and locked disconnects in the SAMPLE 1 location and the closed and the INLET and OUTLET valves are op	d on the quick BYPASS valve is pen. []				
			 Connect the Pressure Monitor unit to the being used. 	e cart/cask []				
			 Plug the AC power cord into the outlet r and turn on the Pressure Monitor to the corresponding to the cart/cask being use 	cell number				
		b.	Flace the following valve switches on the CCF position:	o in the AUTO				
			CCP-AV-1 CCP-SV-1.2 CCP-SV-5 CCP-AV-2 CCP-SV-10					
		с.	Ensure that CASP-V-17 is closed	[]				
		d.	Ensure that the following valves are in the p indicated:	osition []				
			CASP-V-16 to CASP-DV-1 CASP-DV-1 to CASP-SF-5	[]				
		e.	At the CASP, verify that the green INACTIVE L not, push the RESET button directly below the ACTIVE/INACTIVE lights.	ight is on. If []				
		f.	At the CCP, press the SYSTEM RESET pushbutton	[]				
		g.	At the Containment Isolation Valve Panel open valves:	the following				
			FCV-698 FCV-699 FCV-700	[]				

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DIABLO CANYON P	OWER PLANT UNIT NO(S) 1 AND 2	NUMBER EP RB-16:I REVISION O DATE 7/20/84 PAGE 3 OF 5
TITLE UNDIL (NOT INT	DST-ACCIDENT SAMPLING SYSTEM UTED CONTAINMENT AIR SAMPLING ENDED TO MEET THE 3-HOUR TIME LIMIT)	
h.	Press the EXERCISE START pushbutton.	[]
	NOTE: The system will automatically through the following sequents	sample containment air ial operations:
	2 minute presample backflush 3 minute sample capture 15 second equilibrate flask pressure 3 minute residual gas removal 15 second post sample backflush 15 second post sample backflush	
1.	When the ISOLATION SAMPLE FLASK alarm	n sounds, proceed to the
	 Press the EXERCISE STOP pushbutt light in the knob is lit. 	ton and verify the red
	 a) Note containment pressure a CASP-PI-1109 and record it the CCP along with the init taking the sample. 	as indicated on on the printer paper at tials of the person [] PI-1109
	 Using the meter-long reach rod, OUTLET valves and open the BYPAS cart/cask. 	close the INLET and SS valve on the []
	3) At the CCP, release the EXERCISE press the EXERCISE START pushbut SAMPLE LINE FLASK FLUSH timer is	STOP pushbutton and to stop and verify that the son.
	<u>NOTE</u> : If the above steps 1) - 3 minutes, the program sequ home position and the sam manually flushed as detai	are not done within 3 encer will reset to ple flask must be led in step k.
j.	Observe that the SF EXERCISE COMPLETE If indicator is lit proceed to slep 1	light is lit for SF-1.
k.	Manual Sample Flask Line Flushing	
	NOTE: This section is to be done onl COMPLETE light is not on.	y if the SF EXERCISE
	1) Using the meter-long reach rod,	close the INLET and
	ourier valves and open the BTPAS	s valve on the

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TITLE	SENTRY POS UNDILUT (NOT INTEN	OWER PLANT UNIT NO(S) 1 AND 2 NUMBER EP RB-1 REVISION 0 DATE 7/20/84 PAGE 4 OF UTED CONTAINMENT AIR SAMPLING ENDED TO MEET THE 3-HOUR TIME LIMIT)				
		a)	Note conta CASP-PI-11 the CCP al taking the	inment pressur 09 and record ong with the i sample.	e as indicated it on the prin nitials of the	on ter paper at person []
		2) At t posi	he CCP, tur tion.	n all valve sw	itches to the	CLOSED []
		3) Turn	the follow	ing valve swit	ches to the OP	EN position:
		CCP- CCP- CCP-	SV-10 SV-1.2 AV-1			[]
		4) Flus	h the sampl	e flask line f	or 3 minutes.	[]
		5) Clos	e the follo	wing valves:		
		CCP- CCP- CCP-	SV-1.2 AV-1 SV-10			[]
	1. :	Sample Ca	rt/Cask Rem	oval		
		1) Turn cart	off Pressu /cask.	re Monitor and	disconnect fro	om []
	1	2) Unlo cart area	ck the quic /cask assem ·	k disconnects bly and place	from SF-1, remo it in a tempora	ove the ary hold []
	:	3) Deta the cart	ch the pape printer on /cask.	r with the car the CCP an att	t/cask informat ach it to the	tion from []
		NOTE	: Perform cart/cas	a radiation/co k assembly.	ntamination su	rvey on
		4) Inst	all a backu	p cart/cask as	sembly.	[]
	1	5) Push samp stat	the RESET ling flask us.	button at the indicator ligh	CASP to change t from ACTIVE	the to INACTIVE []

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DIABLO CANYON PO SENTRY PO TITLE UNDILU (NOT INTE	NUMBER EP RB-16:I REVISION O DATE 7/20/84 PAGE 5 OF 5		
т.	 6) At the CCP, check closed or close all val switches. At the containment isolation valve panel, clos following valves: 	ve [] e the	
	FCV-698 FCV-699 FCV-700	[]	

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	Pacific Gas and Electric Com ARTMENT OF NUCLEAR PLANT OPERATIONS LO CANYON POWER PLANT UNIT NO(S) 1 EMERGENCY PROCEDURE SENTRY POST-ACCIDENT SAMPLING SAMPLE STORAGE AND DISPOSAL (NOT INTENDED TO MEET THE 3-HO NOVED <u>R. C. TRAM</u> PLANT MANA	Pany NUMBER EP RB-16:J REVISION O DATE 7/17/84 AND 2 PAGE 1 OF 4 SYSTEM UR TIME LIMIT) Aug 7.31-84 GER DATE
DISCUSS	ION	IMPORTANT TO
The purp stripped	pose of this procedure is to provid I-gas samples and storage of RCS lin	e a means for disposal of guid samples.
PRECAUT	ONS	
1. San	ne as EP RB-16:A.	
PREREQUI	SITES	
1. Mod	ified GE-8300 transfer cask.	
2. Gas	bottle Griptong.	
3. 14	cc gas sample bottle.	
PROCEDUR	Ε	
1. Dis	posal of Reactor Coolant Stripped-G	as Samples
a.	At the LSP	
	 Close or check closed valves RC-V-1.1 through RC-V-1.5 	. []
	 Verify that RC-G-4 indicates 100 psig Ar. 	approximately []
b.	At the PCP	
	1) Close or check closed	
	FCV-9351A, FCV-9351-B FCV-9350A, FCV-9350-B	. []

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DIABLO	SENTRY SAMP (NOT IN	OWER POST- LE ST TENDE	PLANT UNIT NO(S) 1 AND 2 ACCIDENT SAMPLING SYSTEM ORAGE AND DISPOSAL D TO MEET THE 3-HOUR TIME LIMIT)	IMBER VISION ATE AGE	EP RB-16:J 0 7/17/84 2 OF 4
			FCV-692, FCV-693, FCV-694 FCV-1412, FCV-1413 FCV-1416, FCV-1417, FCV-1418 FCV-1419, FCV-1420		
	с.	Alig	gn the following valves:		
			RC-V-10 (closed) []] RC-V-15 (closed) []] RC-V-14 (closed) []] RC-V-11 (CLOSED) []] RC-V-13 (closed) []] RC-V-12 (closed) []] RC-DV-2 (9 o'clock) []]		
	٥.	Bott	le Evacuation		
		1)	With the griptong, install the diluted gas so bottle on the front panel needle.	ample [1
		2)	Open RC-V-13.	[1
		3)	Open RC-V-12 and evacuate until RC-G-2.2 ind minimum vacuum of 22 inches mercury.	icates a [3
		4)	Turn RC-DV-2 to the 6 o'clock position and co evacuation until a minimum vacuum of 22 inche mercury is indicated on RC-G-2.2	ontinue es of [the]
		5)	Close in order RC-V-13 and RC-V-12.	[]
		6)	Open RC-V-14 and allow the bottle to pressure approximately 1 psig as indicated on RC-G-2.2	ze to	J
		7)	Close RC-V-14.	[]
		8)	Open RC-V-13 and RC-V-12 and evacuate until R indicates a minimum vacuum of 22 inches mercu	C-G-2.2]
		9)	Close in order RC-V-13 and RC-V-12.	r	1

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DIABLO CA	SENTRY	POWER PLANT UNIT NO(S) 1 AND 2 POST-ACCIDENT SAMPLING SYSTEM PLE STORAGE AND DISPOSAL ITENDED TO MEET THE 3-HOUR TIME LIMIT)	NUMBER EP RB-16:J REVISION O DATE 7/17/84 PAGE 3 OF 4		
	10) Open RC-V-14 and allow the bottle to pressurize to approximately 1 psig as indicated on RC-G-2.2.				
		11) Close RC-V-14.	[]		
		 Repeat steps 8 through 11 three times t radioactive gases. 	co remove all		
	e.	Bottle Disposal			
		1) Remove the griptong from the panel.	[]		
		 Perform a radioactive survey of the bot accordingly. 	tle and dispose []		
2.	Acc	ess and Removal of Liquid Sample Bottle			
	а.	Open the Sentry cart/cask.	[]		
	b.	Align the modified GE-8300 transfer cask ove cart/cask cavity.	r the Sentry		
	c.	Withdraw the tungsten shield at the base of task.	the transfer []		
	d.	Slowly lower the sample bottle access mechanilatch grasps the sample bottle.	ism until the		
	e.	Slowly raise the sample bottle into the cavit transfer cask.	ty of the []		
	f.	Close the tungsten shield at the base of the cask.	transfer []		
	g.	With two persons (one at each arm of the tran carefully move the bottle to the storage loca	isfer cask), ition. []		
	h.	Place the transfer cask on the sample bottle platform.	storage []		
	1.	Withdraw the tungsten shield at the base of t	he transfer		

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DIABLO CANYON POWER PLANT UNIT NO(5) 1 AFO 2 NUMBER EP RB-16: REVISION O DATE 7/17/84 PAGE 4 OF 4					
TITLE	SAMPLE STORAGE AND DISPOSAL (NOT INTENDED TO MEET THE 3-HOUR TIME LIMIT)				
	j.	Slowly lower the sample bottle to the platf the downward movement until the sample bott released.	form and continue le is []		
	k. Raise the bottle access mechanism and close the tungste shield. []				

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PACIFIC GAS AND ELECTRIC COMPANY

PGWE

J. O. SCHUYLER VICE PRESIDENT NUCLEAR POWER GENERATION

August 27, 1984

PGandE Letter No.: DCL-84-291

Mr. John B. Martin, Regional Administrator U. S. Nuclear Regulatory Commission, Region V 1450 Maria Lane, Suite 210 Walnut Creek, CA 94596-5368

Re: Docket No. 50-275, OL-DPR-76 Docket No. 50-323 Diablo Canyon Units 1 and 2 Emergency Plan Implementing Procedures Updates

Dear Mr. Martin:

In accordance with Section V, "Implementing Procedures," of 10 CFR 50, Appendix E, PGandE is submitting one copy of the updates to the detailed Implementing Procedures (Enclosure 2) for the Diablo Canyon Power Plant Units 1 and 2 Emergency Plan. These updates are listed in Enclosure 1. Concurrently, two copies of each update are being submitted to the Document Control Desk.

Kindly acknowledge receipt of the above material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely.

J.O. Schungle

Enclosures

cc: R. Fish Document Control Desk (2) Service List

cc w/o Enc. 2: G. W. Knighton