

Table 11.5-1—Radiation Monitor Detector Parameters
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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Gaseous Waste Processing System (KPL) Test #144 Test #99 Test #153 Test #216	R-1	1 noble gas monitor upstream of the delay beds KPL40CR001	none	none	grab sample	none	3E-7 - 1E-2 μCi/cc (Kr-85, Xe-133)	n/a	n/a	n/a	11.3-1 11.3-2	11.3.1.2.3 11.5.3.1.1 11.5.4.5	NS-AQ	portable
	R-2	none	close the discharge valve on high activity	1 noble gas monitor downstream of the delay beds discharged into NABVS (cell 1) KPL83CR001	grab sample	none	3E-7 - 1E+2 μCi/cc (Kr-85, Xe-133)	n/a	n/a	n/a	11.3-1 11.3-2 11.5-1 9.4.3-2	11.3.1.2.3 11.3.2.3.12 11.5.3.1.1 11.5.4.5	NS-AQ	portable
Vent System for Air Removal (MAQ) Test #144 Test #204	R-3	none	none	1 noble gas monitor on the condenser exhaust MAQ90CR001	none	none	3E-7 - 1E-2 μCi/cc (Kr-85, Xe-133)	n/a	n/a	n/a	11.5-1 10.4.2-2	11.5.4 11.5.3.1.2	Non-safety	built-in

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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Sampling Activity Monitoring System (Vent Stack Release Point System (KLK)) Test #144 Test #92	R-4	none	none	1 noble gas monitor, 1 iodine monitor, 1 iodine accident monitor, 1 aerosol monitor and 1 aerosol accident monitor in the vent stack KLK70CR001 KLK70CR071 KLK70CR072 KLK70CR031 KLK70CR032	none	1 noble gas, 1 noble gas accident, 1 iodine, 1 iodine accident, 1 aerosol, 1 aerosol accident, and 1 H-3, C-14 grab sample points in the vent stack KLK70CR581 KLK70CR582 KLK70CR571 KLK70CR572 KLK70CR561 KLK70CR562 KLK70CR551	3E-7 - 1E+4 μCi/cc (Kr-85, Xe-133)	1E-8- 1E+2 μCi/cc (Cs-137)	5E-11 - 3E-7 μCi/cc (I-131)	n/a	11.3-2 11.5-1 9.4.3-3	11.5.3.1.3	Non-safety	built-in
	R-5	none	none	2 noble gas monitors in the vent stack KLK90CR001 KLK90CR002	none	1 noble gas accident, 1 iodine, 1 iodine accident, 1 aerosol, 1 aerosol accident, and 1 H-3, C-14 grab sample points in the vent stack KLK90CR582 KLK90CR571 KLK90CR572 KLK90CR561 KLK90CR562 KLK90CR551	3E-7 - 1E+4 μCi/cc (Kr-85, Xe-133)	n/a	n/a	n/a	11.3-2 11.5-1 9.4.3-3	11.5.3.1.3	Non-safety	built-in
	R-6	none	none	2 noble gas accident monitors in the vent stack KLK95CR001 KLK95CR002	none	none	1E-4 - 1E+4 rad/hr	n/a	n/a	n/a	11.3-2 11.5-1 9.4.3-3	11.5.3.1.3	Non-safety	built-in

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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Containment Building Low Flow Purge Subsystem (KLA2) Test #144 Test #76	R-7	none	none	1 noble gas, 1 aerosol, 1 iodine monitor KLK10CR001 KLK10CR031 KLK10CR071	none	1 aerosol sample point KLK10CR561	3E-7 - 1E-2 μCi/cc (Kr-85, Xe-133)	3E-10 - 1E-6 μCi/cc (Cs-137)	3E-10 - 5E-8 μCi/cc (I-131)	n/a	11.5-1 9.4.7-2	11.5.3.1.4	Non-safety	built-in
	R-8	none	none	1 H-3 monitor KLK12CR041	none	H-3 sample and analysis	3E-9 - 3E-4 μCi/cc	n/a	n/a	n/a	11.5-1 9.4.7-2	11.5.3.1.4	Non-safety	built-in
	R-9	none	Close KLA supply air damper to the Fuel Building hatch area, when the equipment hatch is open Close KLL exhaust air damper to the area in front of the emergency airlock Opens KLA2 iodine filtration isolation dampers, starts KLA2 iodine filtration unit fans	2 noble gas monitors KLK13CR001 KLK13CR002	none	none	1E-5 - 1E0 rad/hr	n/a	n/a	n/a	11.5-1 9.4.7-2	11.5.3.1.4	NS-AQ	built-in
Containment Building Internal Filtration Subsystem (KLA5) Test #144 Test #75 Test #187	R-10	1 noble gas, 1 aerosol ⁶ , 1 iodine monitor KLK05CR001 KLK05CR031 KLK05CR071	none	none	1 aerosol grab sample KLK05CR561	none	3E-7 - 1E-2 μCi/cc (Kr-85, Xe-133)	3E-10 - 1E-6 μCi/cc (Te-129, Ru-106/ Rh-106)	3E-10 - 5E-8 μCi/cc (I-131)	n/a	11.5-1 9.4.7-3	11.5.3.1.5 11.5.4.8	NS-AQ	built-in

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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Nuclear Auxiliary Building Ventilation System (KLE) Test #144 Test #79	R-11	1 noble gas, 1 iodine, and 1 aerosol monitors on NABVS (cell 1) ventilation exhaust KLK30CR001 KLK30CR071 KLK30CR031	NABVS (cell 1) diverts exhaust to iodine filtration on high activity ¹	none	1 aerosol grab sample point in the ventilation exhaust KLK30CR561	none	3E-7 - 1E-2 μCi/cc (Kr-85, Xe-133)	3E-10 - 1E-6 μCi/cc (Cs-137)	3E-10 - 5E-8 μCi/cc (I-131)	n/a	11.5-1 9.4.3-3	11.5.3.1.6 9.4.3.2.1	NS-AQ	portable
	R-12	1 noble gas, 1 iodine, and 1 aerosol monitors on NABVS (cell 2) ventilation exhaust KLK31CR001 KLK31CR071 KLK31CR031	NABVS (cell 2) diverts exhaust to iodine filtration on high activity ¹	none	1 aerosol grab sample point in the NABVS (cell 2) ventilation exhaust KLK31CR561	none	3E-7 - 1E-2 μCi/cc (Kr-85, Xe-133)	3E-10 - 1E-6 μCi/cc (Cs-137)	3E-10 - 5E-8 μCi/cc (I-131)	n/a	9.4.3-3	11.5.3.1.6 9.4.3.2.1	NS-AQ	portable
	R-13	1 noble gas, 1 iodine, and 1 aerosol monitors on NABVS (cell 3) ventilation exhaust KLK32CR001 KLK32CR071 KLK32CR031	NABVS (cell 3) diverts exhaust to iodine filtration on high activity ¹	none	1 aerosol grab sample point in the ventilation exhaust KLK32CR561	none	3E-7 - 1E-2 μCi/cc (Kr-85, Xe-133)	3E-10 - 1E-6 μCi/cc (Cs-137)	3E-10 - 5E-8 μCi/cc (I-131)	n/a	9.4.3-3	11.5.3.1.6 9.4.3.2.1	NS-AQ	portable
	R-14	1 aerosol monitor on ventilation exhaust in the hot workshop KLK33CR031	none	none	1 aerosol grab sample point in the ventilation exhaust in the hot workshop KLK33CR561	none	n/a	3E-10 - 1E-6 μCi/cc (Cs-137)	n/a	n/a	9.4.3-2	11.5.3.1.6	Non-safety	portable
	R-15	1 aerosol monitor on ventilation exhaust in laboratory room upstream of NABVS iodine filtration train KLK41CR031	none	none	1 aerosol grab sample point in the ventilation exhaust KLK41CR561	none	n/a	3E-10 - 1E-6 μCi/cc (Cs-137)	n/a	n/a	9.4.3-2	11.5.3.1.6	Non-safety	portable

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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Nuclear Auxiliary Building Ventilation System (KLE) (continued)	R-16 ⁹	none	none	none	1 iodine and 1 aerosol sample points in the ventilation exhaust KLK42CR571 KLK42CR561	none	n/a	n/a	n/a	n/a	9.4.3-5	11.5.3.1.6	Non-safety	portable
Fuel Building Ventilation System (KLL) Test #144 Test #81	R-17	1 noble gas, 1 aerosol, and 1 iodine monitors on FBVS (cell 4) ventilation exhaust KLK34CR001 KLK34CR031 KLK34CR071	FBVS (cell 4) exhaust feeds into NABVS which diverts exhaust to iodine filtration on high activity ^{1 3}	none	1 aerosol grab sample point in the ventilation exhaust KLK34CR561	none	3E-7 - 1E-2 μCi/cc (Kr-85, Xe-133)	3E-10 - 1E-6 μCi/cc (Cs-137)	3E-10 - 5E-8 μCi/cc (I-131)	n/a	9.4.3-3	9.4.2 11.5.3.1.7	NS-AQ	portable
	R-18	1 noble gas, 1 aerosol, and 1 iodine monitors on FBVS (cell 5) ventilation exhaust KLK35CR001 KLK35CR031 KLK35CR071	FBVS (cell 5) exhaust feeds into NABVS which diverts exhaust to iodine filtration on high activity ^{1 3}	none	1 aerosol grab sample point in the FB ventilation exhaust KLK35CR561	none	3E-7 - 1E-2 μCi/cc (Kr-85, Xe-133)	3E-10 - 1E-6 μCi/cc (Cs-137)	3E-10 - 5E-8 μCi/cc (I-131)	n/a	9.4.3-3	9.4.2 11.5.3.1.7	NS-AQ	portable
	R-19	2 noble gas monitors on ventilation exhaust of the fuel handling area KLK38CR001 KLK38CR002	isolate fuel handling area ventilation (cell 5) feeds into SBVS on high exhaust activity, 2 noble gas monitors supply the signal	none	none	none	1E-5 - 1E+0 rad/hr	n/a	n/a	n/a	9.4.2-1 11.5-1	9.4.2.2.3 11.5.3.1.7	NS-AQ	portable

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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Radioactive Waste Building Ventilation System (KLF) Test #144 Test #80	R-20	1 iodine and 1 aerosol monitors upstream of ventilation filters in Cell 1 KLK50CR071 KLK50CR031	Close KLF room exhaust air normal carbon bypass isolation dampers Opens KLF carbon filtration unit isolation dampers and the air is directed through the carbon filter and exhausts this air through the plant vent stack	none	1 aerosol sample point upstream of the ventilation filters KLK50CR561	none	none	3E-10 - 1E-6 μ Ci/cc (Cs-137)	3E-10 - 5E-8 μ Ci/cc (I-131)	n/a	9.4.8-2	11.5.3.1.8	NS-AQ	portable
	R-21 ⁹	none	none	none	none	1 aerosol and 1 iodine sample points in the RWB ventilation exhaust KLK51CR561 KLK51CR571	none	none	none	n/a	9.4.8-2 11.5-1	11.5.3.1.8	non-safety	n/a

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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Radioactive Waste Building Ventilation System (KLF) (continued)	R-22	1 iodine and 1 aerosol monitors upstream of ventilation filters in Cell 2 KLK52CR071 KLK52CR031	Close KLF room exhaust air normal carbon bypass isolation dampers Opens KLF carbon filtration unit isolation dampers and the air is directed through the carbon filter and exhausts this air through the plant vent stack	none	1 aerosol sample point upstream of the ventilation filters KLK52CR561	none	none	3E-10 - 1E-6 μ Ci/cc (Cs-137)	3E-10 - 5E-8 μ Ci/cc (I-131)	n/a	9.4.8-2	11.5.3.1.8	NS-AQ	portable
	R-23	1 aerosol monitor upstream of ventilation filters in decontamination room KLK53CR031	none	none	1 aerosol sample point upstream of the ventilation filters KLK53CR561	none	none	3E-10 - 1E-6 μ Ci/cc (Cs-137)	n/a	n/a	9.4.8-1	11.5.3.1.8	non-safety	portable
	R-24	1 aerosol monitor upstream of ventilation filters in workshop KLK54CR031	none	none	1 aerosol sample point upstream of the ventilation filters KLK54CR561	none	none	3E-10 - 1E-6 μ Ci/cc (Cs-137)	n/a	n/a	9.4.8-1 11.5-1	11.5.3.1.8	non-safety	portable
Turbine Gland Sealing Condenser Vent System (MAW)	n/a	The turbine gland seal condenser vent joins the exhaust line from the main condenser evacuation system upstream of radiological measuring point R-3. Therefore, R-3 monitors both the main condenser evacuation system and the turbine gland seal condenser vent system. See R-3 for details.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Main Condenser Evacuation System (MAJ)	n/a	This system is used only during plant startup when an accident that could release gaseous radioactive material that could reach this system is unlikely and is therefore not monitored.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Evaporator Vent Systems	n/a	The boron recovery evaporator in the coolant treatment system vents to the ventilation cell in which it is located in the Nuclear Auxiliary Building. The exhaust from the cell is monitored as shown above in the Auxiliary Building ventilation system. The evaporator in the Radwaste Building is monitored by the Radwaste Building ventilation which is described above.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Liquid Waste Processing System (Pretreatment Liquid Radwaste Tank Vent Gas Systems (KPF))	n/a	All liquid radwaste processes are monitored by the Radwaste Building ventilation which is described above.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Steam Generator Blowdown System (Flash Tank and Steam Generator Blowdown Vent Systems (LCQ))	n/a	There are no vents to atmosphere in the steam generator blowdown system. The steam generator blowdown flash tank is vented to the feedwater tank where the vented vapor is mixed with the incoming feedwater and is conveyed to the steam generator.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Pressurizer & Boron Recovery Vent Systems (KT)	n/a	The pressurizer is vented to the Nuclear Island Drains and Vents System which routes gaseous radioactive wastes to the gaseous waste processing system. The coolant treatment system which contains the boron recovery sub-system is vented to the gaseous waste processing system.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Solid Waste Management System (Waste compactors, shredders, etc. (as permanently installed or mobile systems (KPE))	n/a	Solid waste components that could generate airborne wastes are monitored by the Radwaste Building ventilation which is described above.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Safeguard Building Controlled Area Ventilation System (KLC) Test #144 Test #83	R-25	1 noble gas, 1 aerosol and 1 iodine monitors on NABVS cell 6 ventilation exhaust KLK36CR001 KLK36CR031 KLK36CR071	SBVS (cell 6) exhaust feeds into NABVS which diverts exhaust to the NABVS iodine filtration on high activity ^{1 3}	none	1 aerosol sample points in the NABVS ventilation exhaust KLK36CR561	none	3E-7 - 1E-2 μCi/cc (Kr-85, Xe-133)	3E-10 - 1E-6 μCi/cc (Cs-137)	3E-10 - 5E-8 μCi/cc (I-131)	n/a	9.4.3-3	11.5.3.1.9	NS-AQ	portable
	R-26	none	none	2 noble gas accident monitors on SBVS controlled area accident exhaust train ² KLK37CR001 KLK37CR002	none	1 iodine and 1 aerosol sample points in the SBVS controlled area accident exhaust train KLK37CR571 KLK37CR561	1E-4 - 1E+4 rad/hr	n/a	n/a	n/a	9.4.5-2	11.5.3	Non-safety	portable

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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Annulus Ventilation System (KLB) Test #144 Test #77	R-27	none	none	2 noble gas accident monitors in the ventilation exhaust KLK21CR001 KLK21CR002	none	none	1E-4 - 1E+4 rad/hr	n/a	n/a	n/a	6.2.3-2	6.2.3.2.2.2 11.5.3.1.10	NS-AQ	built-in
	R-28 ⁹	none	none	none	none	1 aerosol and 1 iodine accident sample points in the RWB ventilation exhaust KLK20CR561 KLK20CR571	n/a	n/a	n/a	n/a	6.2.3-2 11.5-1	6.2.3.2.2.2 11.5.3.1.10	Non-safety	n/a

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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Main Control Room Air Conditioning System (SAB) Test #144 Test #82 Test #143	R-29 ¹⁹	2 radiation monitors KLK65CR001 KLK65CR002	Opens CREF iodine filtration unit isolation dampers Closes the CREF iodine filtration unit bypass dampers Initiates CREF fans and the inlet air is directed through the carbon filters to the CRE	none	none	none	1E-5 - 1E+1 rad/hr	n/a	n/a	n/a	9.4.1-1	9.4.1.1 11.5.3.1.11	Safety	built-in
	R-30 ¹⁹	2 radiation monitors KLK66CR001 KLK66CR002	Opens CREF iodine filtration unit isolation dampers Closes the CREF iodine filtration unit bypass dampers Initiates CREF fans and the inlet air is directed through the carbon filters to the CRE	none	none	none	1E-5 - 1E+1 rad/hr	n/a	n/a	n/a	9.4.1-1	9.4.1.1 11.5.3.1.11	Safety	built-in

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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Access Building Ventilation System (KLD) Test #224	R-31 ⁹	none	none	none	1 aerosol and 1 iodine in the ventilation exhaust KLK40CR561 KLK40CR571	none	n/a	n/a	n/a	n/a	9.4.14-2	11.5.3.1.12	Non-safety	n/a
Liquid Radwaste (Batch) Effluent System (KPF) Test #144 Test #95 Test #215 Test #153	R-32	none	close the discharge valve on high activity	2 redundant monitors on the liquid radwaste release line KPK29CR001 KPK29CR002	none	H-3 grab sample and analysis	n/a	n/a	n/a	5E-6 - 1E-3 μ Ci/ml (Cs-137)	11.2-1 11.5-1	11.2.1.2.3 11.5.3.2	NS-AQ	portable
Liquid Radwaste (Continuous) Effluent System (KPF)	n/a	The US EPR uses a batch liquid radwaste effluent discharge which is monitored as described above.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Circulating Water System (PA)	n/a	For the US EPR, the CWS has no contact with the Turbine Building Plant Drainage.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Component Cooling Water System (KA) Test #144 Test #153	R-35	1 radiation monitor on each loop KAA10CR001	isolate the CCWS train on high activity	none	grab sample and analysis, H-3 analysis	none	n/a	n/a	n/a	1E-6 - 1E-3 μ Ci/ml (Cs-137)	9.2.2-1 Sh.1 11.5-1	11.5.4.4 9.2.2.2.1	NS-AQ	portable
	R-36	1 radiation monitor on each loop KAA20CR001	isolate the CCWS train on high activity	none	grab sample and analysis, H-3 analysis	none	n/a	n/a	n/a	1E-6 - 1E-3 μ Ci/ml (Cs-137)	9.2.2-1 Sh.1 11.5-1	11.5.4.4 9.2.2.2.1	NS-AQ	portable
	R-37	1 radiation monitor on each loop KAA30CR001	isolate the CCWS train on high activity	none	grab sample and analysis, H-3 analysis	none	n/a	n/a	n/a	1E-6 - 1E-3 μ Ci/ml (Cs-137)	9.2.2-1 Sh.1 11.5-1	11.5.4.4 9.2.2.2.1	NS-AQ	portable
	R-38	1 radiation monitor on each loop KAA40CR001	isolate the CCWS train on high activity	none	grab sample and analysis, H-3 analysis	none	n/a	n/a	n/a	1E-6 - 1E-3 μ Ci/ml (Cs-137)	9.2.2-1 Sh.1 11.5-1	11.5.4.4 9.2.2.2.1	NS-AQ	portable
Fuel Pool Cooling and Fuel Pool Purification System (FAK, FAL) Test #153	R-39 ⁹	none	none	none	grab sample and analysis, H-3 analysis	none	none	n/a	n/a	n/a	n/a	9.1.3.4 11.5.4.10	Non-safety	n/a

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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Nuclear Island Drain and Vent Systems (KT) Test #153	R-40 ⁹	none	none	none	grab sample and analysis, H-3 analysis	none	n/a	n/a	n/a	n/a	n/a	11.5.4.11	Non-safety	n/a
Phase Separator Decant & Holding Basin Systems (KPE)	n/a	For the US EPR, this is handled by the solid radwaste system.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chemical & Regeneration Solution Waste Systems (KT)	n/a	For the US EPR these waste stream are collected by the Nuclear Island Drains and Vents System which is routed to the liquid radwaste storage tanks.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Nuclear Sampling System (KU) Test #144 Test #204 Test #205 Test #153 Test #100	R-41	1 noble gas monitor KUA66CR001	none	none	grab sample and analysis, H-3 analysis	none	3E-7 - 3E+3 μCi/cc (Kr-85, Xe-133)	n/a	n/a	n/a	9.3.2-1 Sh.2 11.5-1	11.5.4.6	NS-AQ	portable
Decontamination Waste Systems & Laundry Handling Room (FK) n/a	R-42	1 protective clothing monitor (no laundry processing on site) SRP10CR051 (Frisker)	none	none	none	none	n/a	n/a	n/a	n/a	n/a	11.5.4.1.2	Non-safety	portable

Table 11.5-1—Radiation Monitor Detector Parameters
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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Solid Waste Management System (KPE) Test #93 Test #94	R-43	Process Monitor 7 dose rate detectors and 1 gamma spectroscopy system on the drum drying station KPC90CR501 KPC90CR502 KPC90CR503 KPC90CR504 KPC90CR505 KPC90CR506 KPC90CR507 KPC90CR508	none	none	none	none	n/a	n//a	n/a	1E-4 - 1E+0 rad/hr	11.4-1 11.5-1	11.5.4.13 11.4.1.2.4	Non-safety	portable
Rainwater Collection and Drainage System (Storm & Underdrain Water System)	n/a	Systems that are potentially radioactive are segregated from non-radioactive systems, such as rainwater collection and drainage systems, to minimize the migration of radioactive material across systems. Monitoring is not required.					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Nuclear Island Drain and Vent System (KT)	R-44 ⁹	none	none	none	grab sample and analysis, H-3 analysis	none	n/a	n/a	n/a	n/a	n/a	11.5.4.11	Non-safety	n/a
Reactor Boron and Water Makeup System (KBC) Test #153	R-45 ⁹	none	none	none	grab sample and analysis, H-3 analysis	none	n/a	n/a	n/a	n/a	n/a	11.5.4.14	Non-safety	n/a

Table 11.5-1—Radiation Monitor Detector Parameters
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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Steam Generator Blowdown System (LCQ) Test #144 Test #67 Test#71	R-46	1 radiation monitor on each steam generator blowdown line QUC11CR001	none ⁷	none	grab sample and analysis, H-3 analysis	none	n/a	n/a	n/a	3E-6 -1E-2 μCi/ml (Cs-137)	11.5-1	Table 9.3.2-2 11.5.4.3	Non-safety	portable
	R-47	1 radiation monitor on each steam generator blowdown line QUC12CR001	none ⁷	none	grab sample and analysis, H-3 analysis	none	n/a	n/a	n/a	3E-6 -1E-2 μCi/ml (Cs-137)	11.5-1	Table 9.3.2-2 11.5.4.3	Non-safety	portable
	R-48	1 radiation monitor on each steam generator blowdown line QUC13CR001	none ⁷	none	grab sample and analysis, H-3 analysis	none	n/a	n/a	n/a	3E-6 -1E-2 μCi/ml (Cs-137)	11.5-1	Table 9.3.2-2 11.5.4.3	Non-safety	portable
	R-49	1 radiation monitor on each steam generator blowdown line QUC14CR001	none ⁷	none	grab sample and analysis, H-3 analysis	none	n/a	n/a	n/a	3E-6 -1E-2 μCi/ml (Cs-137)	11.5-1	Table 9.3.2-2 11.5.4.3	Non-safety	portable
Plant Drainage System (GM) Test #144	R-50	none	none	1 radiation monitor on the common release line	none	grab sample and analysis, H-3 analysis	n/a	n/a	n/a	3E-6 - 1E-2 μCi/ml (Cs-137)	11.5-1	11.5.4.15	Non-safety	built-in
Clean Drains System ⁴ (Noncontaminated Wastewater & Turbine Building Clean Drain System (LCM)) Test #144	R-65 ⁹	none	none	none	none	grab sample and analysis, H-3 analysis	n/a	n/a	n/a	n/a	n/a	11.5.4.16	Non-safety	n/a

Table 11.5-1—Radiation Monitor Detector Parameters
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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Chemical and Volume Control System (High Pressure Coolers) Detection on CCWS Common Loop (KBA, KBD) Test #144 Test #153	R-51	radiation monitors are on the component cooling inlet of each cooler KAB60CR001	isolate the CCWS train on high activity	none	none	none	n/a	n/a	n/a	3E-5 - 3E+0 µCi/ml (Cs-137)	9.2.2-2 Sh.2	9.2.2.2.1 9.2.2.3.1 11.5.4.17	NS-AQ	built-in
	R-52	radiation monitors are on the component cooling outlet of each cooler KAB60CR002	isolate the CCWS train on high activity	none	none	none	n/a	n/a	n/a	3E-5 - 3E+0 µCi/ml (Cs-137)	9.2.2-2 Sh. 2	9.2.2.2.1 9.2.2.3.1 11.5.4.17	NS-AQ	built-in
	R-53	radiation monitors are on the component cooling inlet of each cooler KAB70CR001	isolate the CCWS train on high activity	none	none	none	n/a	n/a	n/a	3E-5 - 3E+0 µCi/ml (Cs-137)	9.2.2-3 Sh. 2	9.2.2.2.1 9.2.2.3.1 11.5.4.17	NS-AQ	built-in
	R-54	radiation monitors are on the component cooling outlet of each cooler KAB70CR002	isolate the CCWS train on high activity	none	none	none	n/a	n/a	n/a	3E-5 - 3E+0 µCi/ml (Cs-137)	9.2.2-3 Sh. 2	9.2.2.2.1 9.2.2.3.1 11.5.4.17	NS-AQ	built-in
Component Cooling Water System (KA) Test #144 Test #153	R-64	1 radiation monitor on the dedicated CCWS loop KAA50CR001	none	none	none	sample and analysis, H-3 analysis	n/a	n/a	n/a	1E-6 - 1E-3 µCi/ml (Cs-137)	9.2.2-4	9.2.2.2.1 9.2.2.3.1 11.5.4.17	Non-safety	built-in

Table 11.5-1—Radiation Monitor Detector Parameters
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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Main Steam lines (LB)	R-55 ¹⁵	4 N-16 monitors on each main steam line LBA10CR811 LBA10CR821 LBA10CR831 LBA10CR841	none ⁸	none	none	none	1E-8 - 1E-2 μCi/cc (N-16) ¹⁷	n/a	n/a	n/a	10.3-1 Sh. 1	11.5.4.1	Safety	built-in
	R-56 ¹⁵	4 N-16 monitors on each main steam line LBA20CR811 LBA20CR821 LBA20CR831 LBA20CR841	none	none	none	none	1E-8 - 1E-2 μCi/cc (N-16) ¹⁷	n/a	n/a	n/a	10.3-1 Sh. 1	11.5.4.1	Safety	built-in
	R-57 ¹⁵	4 N-16 monitors on each main steam line LBA30CR811 LBA30CR821 LBA30CR831 LBA30CR841	none	none	none	none	1E-8 - 1E-2 μCi/cc (N-16) ¹⁷	n/a	n/a	n/a	10.3-1 Sh. 1	11.5.4.1	Safety	built-in
	R-58 ¹⁵	4 N-16 monitors on each main steam line LBA40CR811 LBA40CR821 LBA40CR831 LBA40CR841	none	none	none	none	1E-8 - 1E-2 μCi/cc (N-16) ¹⁷	n/a	n/a	n/a	10.3-1 Sh. 1	11.5.4.1	Safety	built-in
Safety Chilled Water System (QKA) Test #144	R-59	1 radiation monitor on train 1 downstream of the LHSI sealing fluid cooler	none	none	none	none	n/a	n/a	n/a	1E-6 - 1E-3 μCi/ml (Cs-137)	9.2.8-1 Sh. 3 11.5-1	9.2.8.4 11.5.4.18	Non-safety	portable
	R-60	1 radiation monitor on train 4 downstream of the LHSI sealing fluid cooler	none	none	none	none	n/a	n/a	n/a	1E-6 - 1E-3 μCi/ml (Cs-137)	9.2.8-1 Sh. 3 11.5-1	9.2.8.4 11.5.4.18	Non-safety	portable

Table 11.5-1—Radiation Monitor Detector Parameters
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Process System and Initial Test Program ¹⁰	Rad Meas Pt	Monitor Provisions ¹¹			Sample Provisions ^{12, 14}		noble gas H-3 or N-16 monitor range ^{13, 18}	aerosol monitor range ^{13, 18}	iodine monitor range ^{13, 18}	liquid monitor range ^{13, 18}	Figure	Text	safety grade	check source
		In-Process continuous	ACF	In-Effluent continuous	In-Process sample	In-Effluent sample								
Chilled Water for Gaseous Waste (QNA, QNB)	R-61 ⁹	none	none	none	sample and analysis, H-3 analysis	none	n/a	n/a	n/a	1E-6 - 1E-3 μ Ci/ml (Cs-137)	none	11.5.4.7	Non-safety	n/a
Essential Service Water System – Train Monitoring (PE) Test #144	R-66	1 monitor on Train 1 CCWS HX Outlet PEB10CR001	Alarm in the Control Room on high activity	none	sample and analysis, H-3 analysis	none	n/a	n/a	n/a	1E-6 - 1E-3 μ Ci/ml (Cs-137)	9.2.1-1, Sh.2 11.5-1	9.2.1.2 11.5.4	Non-safety	portable
	R-67	1 monitor on Train 2 CCWS HX Outlet PEP20CR001	Alarm in the Control Room on high activity	none	sample and analysis, H-3 analysis	none	n/a	n/a	n/a	1E-6 - 1E-3 μ Ci/ml (Cs-137)	9.2.1-1, Sh.2 11.5-1	9.2.1.2 11.5.4	Non-safety	portable
	R-68	1 monitor on Train 3 CCWS HX Outlet PEP30CR001	Alarm in the Control Room on high activity	none	sample and analysis, H-3 analysis	none	n/a	n/a	n/a	1E-6 - 1E-3 μ Ci/ml (Cs-137)	9.2.1-1, Sh.2 11.5-1	9.2.1.2 11.5.4	Non-safety	portable
	R-69	1 monitor on Train 4 CCWS HX Outlet PEP40CR001	Alarm in the Control Room on high activity	none	sample and analysis, H-3 analysis	none	n/a	n/a	n/a	1E-6 - 1E-3 μ Ci/ml (Cs-137)	9.2.1-1, Sh.2 11.5-1	9.2.1.2 11.5.4	Non-safety	portable
Essential Service Water System – Dedicated Train Test #144	R-70	1 monitor on Dedicated Train CCWS HX Outlet PEB80CR001	Alarm in the Control Room on high activity	none	sample and analysis, H-3 analysis	none	n/a	n/a	n/a	1E-6 - 1E-3 μ Ci/ml (Cs-137)	9.2.1-1, Sh.4 11.5-1	9.2.1.2 11.5.4	Non-safety	portable

Notes:

1. This is a non-safety Automatic Control Feature which diverts flow to the KLE iodine filtration train.
2. Note that a containment isolation signal or high radiation from the in-containment high range monitors (i.e., an accident has occurred) will automatically divert SBVS and FBVS exhaust flow to the KLC accident exhaust filtration trains (Refer to Figure 9.4.5-2 for the SBVS and Figure 9.4.2-1 and Figure 9.4.5-2 for the FBVS). This is a separate iodine filtration train from the KLE iodine filtration train which is shown on Figure 9.4.3-4.
3. The Fuel Building exhaust (cells 4 & 5) and the Safeguard Building exhaust (cell 6) feed into the NABVS as shown on Figure 9.4.3-3. The radiation detector is very close to the boundary between the FBVS and NABVS and the boundary between the SBVS and NABVS. While the exhaust comes from the FBVS and SBVS, the radiation detectors and the automatic control features are within the NABVS. Hence, the diversion of exhaust to the NABVS iodine filtration train on high activity.
4. The clean drains are collected and routed to the main condenser.
5. Footnote 5 not used.

6. This monitor is used for RCS leakage detection to satisfy TS 16.3.4.14.
7. Steam generator blowdown high activity does not alone constitute a signal to isolate SGBS, however when coupled with a partial cooldown signal, the SGBS of the affected steam generator will automatically be isolated.
8. The main steam activity does not alone constitute a signal for an automatic control feature. The electronic logic is that a partial cooldown signal AND either a main steam high activity OR a steam generator high level will generate a signal to automatically isolate the affected steam generator.
9. This is a sample point that has no monitoring functionality.
10. Initial Test Program (ITP) Test #144 is the primary test for Process and Effluent Radiological Monitoring System (PERMS). Other ancillary ITP tests are also listed for systems utilizing radiation monitors.
11. Radiation monitor designations are as follows:
 - CR001/CR002: Noble Gas or liquid gamma or beta activity monitors.
 - CR031/CR032: Normal operations / post-accident aerosol/particulate monitors.
 - CR071/CR072: Normal operations / post-accident iodine monitors.
12. Sampler designations are as follows:
 - CR551: H-3 and C-14 air sampler evaluated in laboratory.
 - CR561/CR562: Aerosol sampler with particle filter (normal operations / post-accident) evaluated in laboratory.
 - CR571/CR572: Iodine sampler with common filter bed (normal operations / post-accident) evaluated in laboratory.
 - CR581/CR582: Air grab samples (normal operations / post-accident).
13. A COL applicant that references the U.S. EPR design certification is responsible for deriving PERMSS subsystem's lower limits of detection or detection sensitivities, and setpoints (alarms and process termination/diversion) for liquid and gaseous process radiation monitoring equipment not covered by the ODCM based on plant and site-specific conditions and operating characteristics of each installed radiation monitoring subsystem (COL 11.5-3).
14. A COL applicant that references the U.S. EPR design certification is responsible for developing a plant-specific process and effluent radiological sampling and analysis plan for systems not covered by the ODCM, including provisions describing sampling and analytical frequencies, and radiological analyses for the expected types of liquid and gaseous samples and waste media generated by the LWMS, GWMS, and SWMS (COL 11.5-4).
15. This monitor is used for primary to secondary leak redetection to satisfy TS 16.3.4.12 and industry guidance in NEI-97-06.
16. Radionuclide concentrations for the RCS leakage monitor test will be selected to be consistent with the design basis description in Section 11.5.4.8.
17. Radionuclide concentrations for the primary to secondary leakage monitor test will be selected to be consistent with the design basis description in Section 11.5.4.1
18. The radionuclide concentrations for testing monitors will be selected to be a fraction of the monitoring range.
19. Radionuclide concentration for testing this monitor will be selected to be above three times the nominal background at full power (See Table 15.0-8).