

## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

### APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

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#### **Question No. 06.04-1**

GDC 19 provides criteria on control room habitability, including dose to operators. The design basis accident (DBA) dose analyses in DCD Chapter 15 were performed, in part, to show compliance with GDC 19 and the results are listed in DCD Table 6.4-2. The DBA dose analyses make assumptions on the control room (CR) heating, ventilation and air conditioning (HVAC) system operation as documented in DCD Tables 15.1.5-12, 15.2.8-3, 15.3.3-3, 15.4.8-4, 15.6.2-4, 15.6.3-5, 15.6.5-13 and 15.7.4-1. Information on the operation of CR HVAC system, including the emergency mode which can be initiated by radiation monitors in the system intake, is discussed on DCD page 6.4-5 and in DCD section 9.4.1.2. Demonstrate how you ensure that the CR HVAC system intake radiation monitor engineered safety feature actuation system – control room emergency ventilation actuation signal (ESFAS-CREVAS) actuation setpoint, provided in DCD Table 7.3-5B, is set so that CR HVAC system operation, including the time of emergency mode initiation, is as assumed in the DBA dose analyses.

#### **Response**

KHNP understands that this question is requesting to demonstrate if the airborne concentration of MCR intake air reaches to the ESFAS-CREVAS setpoint of 0.52 Bq/cc after each DBA and if the time to start operation of the emergency ventilation system of 5 minutes, as assumed in the DBA dose analyses, is ensured.

The MCR emergency ventilation system is actuated by either the SIAS (Safety Injection Actuation Signal) or the high radiation signal of the MCR air intake radiation monitors. In the DBA dose analyses, it is assumed it takes 5 minutes for the MCR emergency ventilation system to become fully operational to filter contaminated intake air. During this time, it is assumed that the contaminated air enters the MCR without any filtration.

To demonstrate the validity of the DBA analyses, it is shown that the sum of the time for the accident-initiated airborne concentration to reach the setpoint of 0.52 Bq/cc and the time for the emergency ventilation system to start its filtration operation is less than 5 minutes.

The time for the accident-initiated airborne concentration to reach the setpoint is the sum of the release time of the radioactivity from the plant to the environment and the travel time from the release point to the MCR air intake. Since the DBA analyses assume that the released activity is located at the MCR air intake immediately after the release, the travel time does not need to be considered in this calculation.

The release time of radioactivity for each DBA is calculated by the RADTRAD code and the discrete and cumulative activity release rates for each DBA are provided in Tables 1 through 8. Since the MCR intake air radiation monitor is equipped with a noble gas channel, the noble gas activities are only considered. The time-dependent airborne concentration in the MCR intake air is then calculated using the radioactivity release rate and atmospheric dispersion factors from the release points to the MCR air intakes as follows:

$$C = R \times \chi/Q \times CF$$

where,

- C : Airborne activity in the MCR air intake, Bq/cc
- R : Release rate to the environment, Bq/sec
- $\chi/Q$  : Onsite atmospheric dispersion factors from the release points to the MCR air intakes, sec/m<sup>3</sup>
- CF : Conversion factor, 1E-06 m<sup>3</sup>/cc

In this calculation, the same onsite  $\chi/Q$  values as those used in the DBA analyses are used. But, this calculation does not take into account the 50% margin and the reduction factors allowed by RG.1.194 because the ESFAS-CREVAS signal will be generated at the more contaminated air intake.

Tables 1 through 8 show the parameters used in the calculations and the resultant time-dependent airborne activity concentrations in the MCR air intake. The tables show the longest time for the airborne activity to reach the ESFAS-CREVAS signal setpoint of 0.52 Bq/cc is calculated to be 0.0006 hr (2.16 sec) for the Feedwater Line Break Accident.

To determine the time for the emergency ventilation system to start its filtration operation, a Loss of Offsite Power (LOOP) is assumed to occur simultaneously with the actuation of ESFAS-CREVAS. Therefore, the time to start the filtration operation includes the time for the startup of the Emergency Diesel Generator (EDG) (20 seconds), the time for signal processing to start the MCR emergency ventilation air cleaning unit (ACU) fan (5 seconds), and the time for the ACU fan to reach the rated voltage of the motor (10 seconds). Therefore, the total time for the emergency ventilation system to start filtration operation is estimated to be 35 seconds. Since

the closing of the MCR normal ventilation system dampers and opening of the emergency ventilation system dampers occur simultaneously with the above mentioned operations, this damper close/open time of 8.4 seconds is included in the 35 second estimation.

Therefore, it is concluded that the MCR dose analyses for the DBAs are conservative since the sum of the longest time to reach ESFAS-CREVAS setpoint (2.16 seconds) and the actual time of start of the emergency ventilation system (35 seconds) is less than the 5 minutes assumed in the DBA dose analyses.

Table 1. Airborne Activity in the MCR air intake due to Steam Line Breaks Outside Containment

Pre-accident Iodine Spike Case (SLBZPLOOPD)						
Release Path	Item	Time after Accident (hr)				
		0.0002	0.0004	0.0006	0.0008	0.001
P-T-S Iodine Release	Cumulated Release (Bq)	0.000E+00	0.000E+00	0.000E+00	2.784E-01	6.430E-01
	Discrete Release (Bq)	0.000E+00	0.000E+00	0.000E+00	2.784E-01	3.646E-01
	$\chi/Q$ (s/m <sup>3</sup> )	3.00E-02 <sup>Note 1)</sup>				
P-T-S Noble Gas Release	Cumulated Release (Bq)	1.264E+07	5.057E+07	1.138E+08	2.023E+08	3.160E+08
	Discrete Release (Bq)	1.264E+07	3.793E+07	6.321E+07	8.850E+07	1.138E+08
	$\chi/Q$ (s/m <sup>3</sup> )	3.00E-02 <sup>Note 1)</sup>				
Secondary Liquid Iodine Release	Cumulated Release (Bq)	1.173E+02	7.036E+02	1.993E+03	4.220E+03	7.618E+03
	Discrete Release (Bq)	1.173E+02	5.863E+02	1.290E+03	2.227E+03	3.398E+03
	$\chi/Q$ (s/m <sup>3</sup> )	3.00E-02 <sup>Note 1)</sup>				
Airborne activity in the CR air intake (Bq/cc)		5.267E-01	1.580E+00	2.634E+00	3.687E+00	4.741E+00
Event-generated Iodine Spike Case (SLBZPLOOPD)						
Release Path	Item	Time after Accident (hr)				
		0.0002	0.0004	0.0006	0.0008	0.001
P-T-S Iodine Release	Cumulated Release (Bq)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	Discrete Release (Bq)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	$\chi/Q$ (s/m <sup>3</sup> )	3.00E-02 <sup>Note 1)</sup>				
P-T-S Noble Gas Release	Cumulated Release (Bq)	1.264E+07	5.057E+07	1.138E+08	2.023E+08	3.160E+08
	Discrete Release (Bq)	1.264E+07	3.793E+07	6.321E+07	8.850E+07	1.138E+08
	$\chi/Q$ (s/m <sup>3</sup> )	3.00E-02 <sup>Note 1)</sup>				
Secondary Liquid Iodine Release	Cumulated Release (Bq)	1.173E+02	7.036E+02	1.993E+03	4.220E+03	7.618E+03
	Discrete Release (Bq)	1.173E+02	5.863E+02	1.290E+03	2.227E+03	3.398E+03
	$\chi/Q$ (s/m <sup>3</sup> )	3.00E-02 <sup>Note 1)</sup>				
Airborne activity in the CR air intake (Bq/cc)		5.267E-01	1.580E+00	2.634E+00	3.687E+00	4.741E+00

Note 1) This onsite  $\chi/Q$  corresponds to the direct release from the south main steam valve room to the MCR south intake presented in DCD Table 2.3-4. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Table 1. Airborne Activity in the MCR air intake due to Steam Line Breaks Outside Containment  
(Cont'd)

1% Fuel Failure Case (SLBFPDLOOP)						
Release Path	Item	Time after Accident (hr)				
		0.0002	0.0004	0.0006	0.0008	0.001
P-T-S Iodine Release	Cumulated Release (Bq)	0.000E+00	4.936E-01	1.507E+01	4.404E+01	1.017E+02
	Discrete Release (Bq)	0.000E+00	4.936E-01	1.458E+01	2.897E+01	5.766E+01
	$\chi/Q$ (s/m <sup>3</sup> )	3.00E-02 <sup>Note 1)</sup>				
P-T-S Noble Gas Release	Cumulated Release (Bq)	1.270E+08	5.077E+08	1.142E+09	2.030E+09	3.172E+09
	Discrete Release (Bq)	1.270E+08	3.808E+08	6.346E+08	8.882E+08	1.142E+09
	$\chi/Q$ (s/m <sup>3</sup> )	3.00E-02 <sup>Note 1)</sup>				
Secondary Liquid Iodine Release	Cumulated Release (Bq)	1.114E+03	6.684E+03	1.893E+04	4.008E+04	7.234E+04
	Discrete Release (Bq)	1.114E+03	5.569E+03	1.225E+04	2.115E+04	3.226E+04
	$\chi/Q$ (s/m <sup>3</sup> )	3.00E-02 <sup>Note 1)</sup>				
Airborne activity in the CR air intake (Bq/cc)		5.290E+00	1.587E+01	2.644E+01	3.701E+01	4.758E+01

Note 1) This onsite  $\chi/Q$  corresponds to the direct release from the south main steam valve room to the MCR south intake presented in DCD Table 2.3-4. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Table 2. Airborne Activity in the MCR air intake due to Feedwater Line Break

Release Path	Item	Time after Accident (hr)				
		0.0002	0.0004	0.0006	0.0008	0.001
Containment Leakage	Cumulated Release (Bq)	2.478E+01	1.984E+02	6.696E+02	1.587E+03	3.100E+03
	Discrete Release (Bq)	2.478E+01	1.736E+02	4.712E+02	9.177E+02	1.513E+03
	$\chi/Q$ (s/m <sup>3</sup> )	1.99E-03 <sup>Note 1)</sup>				
P-T-S Iodine Release	Cumulated Release (Bq)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	Discrete Release (Bq)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 2)</sup>				
P-T-S Noble Gas Release (Unaffected SG)	Cumulated Release (Bq)	6.314E+06	2.526E+07	5.683E+07	1.010E+08	1.579E+08
	Discrete Release (Bq)	6.314E+06	1.894E+07	3.157E+07	4.420E+07	5.683E+07
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 2)</sup>				
P-T-S Noble Gas Release (Containment)	Cumulated Release (Bq)	1.664E-02	1.331E-01	4.561E-01	1.081E+00	2.111E+00
	Discrete Release (Bq)	1.664E-02	1.165E-01	3.230E-01	6.250E-01	1.030E+00
	$\chi/Q$ (s/m <sup>3</sup> )	1.99E-03 <sup>Note 1)</sup>				
Secondary Liquid Iodine Release	Cumulated Release (Bq)	5.449E-01	2.124E+01	6.025E+01	1.276E+02	2.303E+02
	Discrete Release (Bq)	5.449E-01	2.069E+01	3.901E+01	6.733E+01	1.027E+02
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 2)</sup>				
Airborne activity in the CR air intake (Bq/cc)		1.219E-01	3.657E-01	6.095E-01	8.534E-01	1.097E+00

Note 1) This onsite  $\chi/Q$  corresponds to the direct release from the reactor containment building to the MCR north intake presented in DCD Table 2.3-2. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Note 2) This onsite  $\chi/Q$  corresponds to the direct release from the south atmospheric dump valve to the MCR south intake presented in DCD Table 2.3-7. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Table 3. Airborne Activity in the MCR air intake due to Reactor Coolant Pump Rotor Seizure

Release Path	Item	Time after Accident (hr)				
		0.0002	0.0004	0.0006	0.0008	0.001
P-T-S Iodine Release	Cumulated Release (Bq)	0.000E+00	5.726E-01	1.749E+01	5.110E+01	1.180E+02
	Discrete Release (Bq)	0.000E+00	5.726E-01	1.691E+01	3.362E+01	6.692E+01
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 1)</sup>				
P-T-S Noble Gas Release	Cumulated Release (Bq)	7.821E+08	3.128E+09	7.037E+09	1.251E+10	1.954E+10
	Discrete Release (Bq)	7.821E+08	2.346E+09	3.909E+09	5.472E+09	7.034E+09
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 1)</sup>				
Secondary Liquid Iodine Release	Cumulated Release (Bq)	4.302E-01	1.677E+01	4.757E+01	1.007E+02	1.819E+02
	Discrete Release (Bq)	4.302E-01	1.634E+01	3.080E+01	5.316E+01	8.113E+01
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 1)</sup>				
Airborne activity in the CR air intake (Bq/cc)		1.510E+01	4.529E+01	7.547E+01	1.056E+02	1.358E+02

Note 1) This onsite  $\chi/Q$  corresponds to the direct release from the south atmospheric dump valve to the MCR south intake presented in DCD Table 2.3-7. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Table 4. Airborne Activity in the MCR air intake due to CEA Ejection

Containment Leakage Case						
Release Path	Item	Time after Accident (hr)				
		0.0002	0.0004	0.0006	0.0008	0.001
Containment Leakage	Cumulated Release (Bq)	1.633E+08	6.531E+08	1.469E+09	2.612E+09	4.080E+09
	Discrete Release (Bq)	1.633E+08	4.898E+08	8.161E+08	1.142E+09	1.468E+09
	$\chi/Q$ (s/m <sup>3</sup> )	1.99E-03 <sup>Note 1)</sup>				
Airborne activity in the CR air intake (Bq/cc)		4.513E-01	1.354E+00	2.256E+00	3.157E+00	4.059E+00
Steam System Release Case						
Release Path	Item	Time after Accident (hr)				
		0.0002	0.0004	0.0006	0.0008	0.001
P-T-S Iodine Release	Cumulated Release (Bq)	0.000E+00	1.171E+01	5.272E+01	1.540E+02	3.556E+02
	Discrete Release (Bq)	0.000E+00	1.171E+01	4.101E+01	1.012E+02	2.016E+02
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 2)</sup>				
P-T-S Noble Gas Release	Cumulated Release (Bq)	1.997E+09	7.986E+09	1.797E+10	3.194E+10	4.989E+10
	Discrete Release (Bq)	1.997E+09	5.989E+09	9.981E+09	1.397E+10	1.796E+10
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 2)</sup>				
Secondary Liquid Iodine Release	Cumulated Release (Bq)	6.229E-01	2.428E+01	6.888E+01	1.459E+02	2.633E+02
	Discrete Release (Bq)	6.229E-01	2.366E+01	4.460E+01	7.698E+01	1.175E+02
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 2)</sup>				
Airborne activity in the CR air intake (Bq/cc)		3.855E+01	1.156E+02	1.927E+02	2.697E+02	3.467E+02

Note 1) This onsite  $\chi/Q$  corresponds to the direct release from the reactor containment building to the MCR north intake presented in DCD Table 2.3-2. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Note 2) This onsite  $\chi/Q$  corresponds to the direct release from the south atmospheric dump valve to the MCR south intake presented in DCD Table 2.3-7. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.



Table 5. Airborne Activity in the MCR air intake due to a Double-Ended Break of the Letdown Line Outside Containment

Release Path	Item	Time after Accident (hr)				
		0.0002	0.0004	0.0006	0.0008	0.001
LDLB Iodine and Noble Gas Release	Cumulated Release (Bq)	5.014E+09	2.006E+10	4.513E+10	8.023E+10	1.254E+11
	Discrete Release (Bq)	5.014E+09	1.504E+10	2.507E+10	3.510E+10	4.513E+10
	$\chi/Q$ (s/m <sup>3</sup> )	1.13E-03 <sup>Note 1)</sup>				
P-T-S Iodine Release	Cumulated Release (Bq)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	Discrete Release (Bq)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 2)</sup>				
P-T-S Noble Gas Release	Cumulated Release (Bq)	1.263E+07	5.050E+07	1.136E+08	2.020E+08	3.157E+08
	Discrete Release (Bq)	1.263E+07	3.788E+07	6.313E+07	8.839E+07	1.137E+08
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 2)</sup>				
Secondary Liquid Iodine Release	Cumulated Release (Bq)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	Discrete Release (Bq)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 2)</sup>				
Airborne activity in the CR air intake (Bq/cc)		8.113E+00	2.434E+01	4.057E+01	5.680E+01	7.303E+01

Note 1) This onsite  $\chi/Q$  corresponds to the direct release from the auxiliary building south exhaust to the MCR south intake presented in DCD Table 2.3-10. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Note 2) This onsite  $\chi/Q$  corresponds to the direct release from the south atmospheric dump valve to the MCR south intake presented in DCD Table 2.3-7. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Table 6. Airborne Activity in the MCR air intake due to SGTR with a Loss of Offsite Power

Pre-accident Iodine Spike Case						
Release Path	Item	Time after Accident (hr)				
		0.0002	0.0004	0.0006	0.0008	0.001
P-T-S Iodine Release	Cumulated Release (Bq)	0.000E+00	1.101E+00	3.222E+01	9.410E+01	2.173E+02
	Discrete Release (Bq)	0.000E+00	1.101E+00	3.112E+01	6.187E+01	1.232E+02
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 1)</sup>				
P-T-S Noble Gas Release	Cumulated Release (Bq)	2.993E+09	1.197E+10	2.693E+10	4.788E+10	7.481E+10
	Discrete Release (Bq)	2.993E+09	8.978E+09	1.496E+10	2.095E+10	2.693E+10
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 1)</sup>				
Secondary Liquid Iodine Release	Cumulated Release (Bq)	1.107E+00	4.319E+01	1.224E+02	2.591E+02	4.678E+02
	Discrete Release (Bq)	1.107E+00	4.208E+01	7.918E+01	1.367E+02	2.087E+02
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 1)</sup>				
Airborne activity in the CR air intake (Bq/cc)		5.778E+01	1.733E+02	2.889E+02	4.044E+02	5.199E+02
Event-generated Iodine Spike Case						
Release Path	Item	Time after Accident (hr)				
		0.0002	0.0004	0.0006	0.0008	0.001
P-T-S Iodine Release	Cumulated Release (Bq)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	Discrete Release (Bq)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 1)</sup>				
P-T-S Noble Gas Release	Cumulated Release (Bq)	2.993E+09	1.197E+10	2.693E+10	4.788E+10	7.481E+10
	Discrete Release (Bq)	2.993E+09	8.978E+09	1.496E+10	2.095E+10	2.693E+10
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 1)</sup>				
Secondary Liquid Iodine Release	Cumulated Release (Bq)	1.107E+00	4.319E+01	1.224E+02	2.591E+02	4.678E+02
	Discrete Release (Bq)	1.107E+00	4.208E+01	7.918E+01	1.367E+02	2.087E+02
	$\chi/Q$ (s/m <sup>3</sup> )	1.39E-02 <sup>Note 1)</sup>				
Airborne activity in the CR air intake (Bq/cc)		5.778E+01	1.733E+02	2.889E+02	4.044E+02	5.199E+02

Note 1) This onsite  $\chi/Q$  corresponds to the direct release from the south atmospheric dump valve to the MCR south intake presented in DCD Table 2.3-7. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Table 7. Airborne Activity in the MCR air intake due to a Large Break LOCA

Release Path	Item	Time after Accident (hr)				
		0.0002	0.0004	0.0006	0.0008	0.001
Containment Leakage	Cumulated Release (Bq)	1.834E+06	7.335E+06	1.650E+07	2.934E+07	4.584E+07
	Discrete Release (Bq)	1.834E+06	5.501E+06	9.168E+06	1.284E+07	1.650E+07
	$\chi/Q$ (s/m <sup>3</sup> )	1.99E-03 <sup>Note 1)</sup>				
ESF Leakage	Cumulated Release (Bq)	3.949E-01	2.369E+00	6.713E+00	1.422E+01	2.567E+01
	Discrete Release (Bq)	3.949E-01	1.974E+00	4.344E+00	7.503E+00	1.145E+01
	$\chi/Q$ (s/m <sup>3</sup> )	1.13E-03 <sup>Note 2)</sup>				
CLVPS Release	Cumulated Release (Bq)	9.208E+09	3.683E+10	8.287E+10	1.473E+11	2.302E+11
	Discrete Release (Bq)	9.208E+09	2.762E+10	4.604E+10	6.445E+10	8.285E+10
	$\chi/Q$ (s/m <sup>3</sup> )	3.00E-02 <sup>Note 3)</sup>				
Airborne activity in the CR air intake (Bq/cc)		3.837E+02	1.151E+03	1.918E+03	2.685E+03	3.452E+03

Note 1) This onsite  $\chi/Q$  corresponds to the direct release from the reactor containment building to the MCR north intake presented in DCD Table 2.3-2. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Note 2) This onsite  $\chi/Q$  corresponds to the direct release from the auxiliary building south exhaust to the MCR south intake presented in DCD Table 2.3-10. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Note 3) This onsite  $\chi/Q$  corresponds to the direct release from the south main steam valve room to the MCR south intake presented in DCD Table 2.3-4. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

Table 8. Airborne Activity in the MCR air intake due to Fuel Handling Accident

Release Path	Item	Time after Accident (hr)					
		0.0000	0.0002	0.0004	0.0006	0.0008	0.001
Fuel Handling Area Vent Release	Cumulated Release (Bq)	6.493E+09	2.589E+12	5.183E+12	7.774E+12	1.036E+13	1.295E+13
	Discrete Release (Bq)	-	2.583E+12	2.593E+12	2.591E+12	2.589E+12	2.586E+12
	$\chi/Q$ (s/m <sup>3</sup> )	1.38E-03 <sup>Note 1)</sup>					
Airborne activity in the CR air intake (Bq/cc)		-	4.951E+03	4.971E+03	4.966E+03	4.962E+03	4.957E+03

Note 1) This onsite  $\chi/Q$  corresponds to the direct release from the fuel handling area exhaust to the MCR south intake presented in DCD Table 2.3-12. Since the ESFAS-CREVAS signal will be generated at the more contaminated air intake, it does not take into account the 50% margin and the reduction factor of 8 which was applied in the MCR dose analysis.

### Impact on DCD

There is no impact on the DCD.

### Impact on PRA

There is no impact on the PRA.

### Impact on Technical Specifications

There is no impact on the Technical Specifications.

### Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical or Environmental Report.