

Development of CYPRUS and Its Perspective

December 4, 2009 Jongtae Jeong



Why we develop CYPRUS?

- **CYPRUS** : **CY**ber R&D Platform for Radwaste disposal in Underground Systems, developed by KAERI since 2000.
- **CYPRUS** is an automatically quality assurance system designed to ensure all project member follow the compulsory QA procedures from the first to the last stage of TSPA.
- **CYPRUS** can be used as scenario development, performance assessment, information & data management, etc.
- **CYPRUS** is a user-friendly web-based R&D platform.

CYPRUS





Korea Atomic Energy Research Institute

International Workshop on KMS, Tokyo, Japan, 2009

RES, Scenario & AMF





• Performance Assessment Input Database





Korea Atomic Energy Research Institute

PAID : Classification of data

	ut Keywords :	Delete Keywords		
		× Dividing Characte	r is ","	
** Select Column *		:: Select Column :: 🔹	🕴 😳 Option 🗄 🖌 Search 🔤 Reset	
	Materia	il ID	Material Name	: Specific property of repository system
Backfill Non-saline TILA99		iline TILA99	TILA99 /Backfill/non-saline	
Backfill Saline TILA99		e TILA99	TILA99 /Backfill/saline	
Backfill TILA96		ILA96	TILA96 /Backfill	
BackfillTILA-96Reducing		6Reducing	TILA-96 /Backfill / reducing]
BackfillTILA-99OxidizingNon-Saline,Conservative		n-Saline,Conservative	TILA-99 /Backfill / Oxidizing/ non-saline/ conservative	
BackfillTILA-990xidizingNon-Saline,Conservative		In-Saline, Conservative	TII A-99 /Backfill /Oxidizing/ non-saline/ conservative]
BackfillTILA-990xidizingNon-Saline,Realistic		Non-Saline,Realistic	TILA-99 /Backfill / reducing/ non-saline/ realistic	
BackfillTILA-99ReducingSaline,Conservative		3Saline,Conservative	TILA-99 /Backfill / reducing/ saline/ conservative	
	BackfillTILA-99Reduc	ingSaline,Realistic	TILA-99 /Backfill / reducing/ saline/ realistic	
Bentonite KBS-3		KBS-3	To be a series of the series o	
	22	NDD 0	KBS-3/ Bentonite	
		100 0	KBS-3/ Bentonite	
		ND0-0	KBS-3/ Bentonite	
	Parameter ID		KBS-3/ Bentonite Parameter Name	: Individual data in the repos <mark>itory sys</mark> tem
	Parameter ID KdAc-227		KBS-3/ Bentonite Parameter Name Distribution coefficient Ac-222 [m3/kg]	: Individual data in the repository system
	Parameter ID KdAc-227 KdAm-241		KBS-3/ Bentonite Parameter Name Distribution coefficient Ac-227 [m3/kg] Distribution coefficient Am-241 [m3/kg]	: Individual data in the repository system
	Parameter ID KdAc-227 KdAm-241 KdAm-243+d		KBS-3/ Bentonite Parameter Name Distribution coefficient Ac-227 [m3/kg] Distribution coefficient Am-241 [m3/kg] Distribution coefficient Am-243 d [m3/kg] Distribution coefficient CM-2434 d [m3/kg]	: Individual data in the repository system
	Parameter ID KdAc-227 KdAm-243+d KdC-14 KdC-14		KBS-3/ Bentonite Parameter Name Distribution coefficient Ar-227 (m3/kg) Distribution coefficient Am-241 [m3/kg] Distribution coefficient Am-243-d [m3/kg] Distribution coefficient C-14	: Individual data in the repository system
	Parameter ID KdAc-227 KdAm-241 KdAm-243+d KdC-14 KdCl-36 KdCl-36		KBS-3/ Bentonite Parameter Name Distribution coefficient Ar-222 [m3/kg] Distribution coefficient Am-241 [m3/kg] Distribution coefficient C-14 [m3/kg] Distribution coefficient C-14 [m3/kg] Distribution coefficient C-24 [m3/	: Individual data in the repository system
	Parameter ID KdAc-227 KdAm-243 KdCn-243 KdCl-36 KdCm-245 KdCm-246		KBS-3/ Bentonite Parameter Name Distribution coefficient Ar-222 [m3/kg] Distribution coefficient Am-241 [m3/kg] Distribution coefficient C-14 [m3/kg] Distribution coefficient C-14 [m3/kg] Distribution coefficient C-14 [m3/kg] Distribution coefficient C-245 [m3/kg] Distribution coefficient Cm-245 [m3/kg] Distribution coefficient Cm-245 [m3/kg] Distribution coefficient Cm-245 [m3/kg] Distribution coefficient Cm-245 [m3/kg]	: Individual data in the repository system
	Parameter 1D Kd&c-227 KdAm-241 KdAm-243+d KdC-14 KdC-14 KdC-16 KdCm-245 KdCm-245 KdCm-246		KBS-3/ Bentonite Parameter Name Distribution coefficient An-242 [m3/kg] Distribution coefficient Am-243+d [m3/kg] Distribution coefficient Cl-36 [m3/kg] Distribution coefficient Ch-245 [m3/kg]	: Individual data in the repository system
	Parameter ID KdAc-227 KdAm-241 KdAm-243+d KdC-14 KdC-14 KdC-36 KdCs-135 KdCs-137		KBS-3/ Bentonite Parameter Name Distribution coefficient Ac-227 [m3/kg] Distribution coefficient Am-241 [m3/kg] Distribution coefficient C-14 [m3/kg] Distribution coefficient C-14 [m3/kg] Distribution coefficient C-36 [m3/kg] Distribution coefficient Cm-245 [m3/kg] Distribution coefficient Cm-246 [m3/kg] Distribution coefficient Cm-246 [m3/kg] Distribution coefficient Cs-135 [m3/kg] Distribution coefficient Cs-137 [m3/kg]	: Individual data in the repository system
	Parameter 1D KdAc-227 KdAm-243 KdAm-243+d KdCl-36 KdCm-245 KdCm-245 KdCs-135 KdCs-137 KdI-129		KBS-3/ Bentonite Parameter Name Distribution coefficient Ac-227 [m3/kg] Distribution coefficient Am-241 [m3/kg] Distribution coefficient C-14 [m3/kg] Distribution coefficient C-14 [m3/kg] Distribution coefficient C-245 [m3/kg] Distribution coefficient Cm-245 [m3/kg] Distribution coefficient Cm-245 [m3/kg] Distribution coefficient Cs-135 [m3/kg] Distribution coefficient Cs-137 [m3/kg] Distribution coefficient Cs-137 [m3/kg] Distribution coefficient Cs-137 [m3/kg]	: Individual data in the repository system
	Parameter ID KdAc-227 KdAm-243 KdAm-243+d KdCl-36 KdCm-245 KdCm-245 KdCs-135 KdCs-137 KdI-129 KdKr-85		KBS-3/ Bentonite Parameter Name Distribution coefficient Am-243 [m3/kg] Distribution coefficient Am-244 [m3/kg] Distribution coefficient C-14 [m3/kg] Distribution coefficient C-36 [m3/kg] Distribution coefficient Cm-245 [m3/kg] Distribution coefficient Cm-245 [m3/kg] Distribution coefficient Cm-245 [m3/kg] Distribution coefficient Cs-135 [m3/kg] Distribution coefficient Cs-137 [m3/kg] Distribution coefficient 1-129 [m3/kg] Distribution coefficient 1-29 [m3/kg]	: Individual data in the repository system

PAID View Form

Matorial Namo				
Material Name	H12 /EDZ		Material ID	H12EDZ
Parameter Name	Distribution coef [m3/kg]	ficient Am	Parameter ID	KdAm
Name of PAA	Yongsoo Hwang		Name of Applicable PA Code	
Name of Parameter (Defined in the Applicable	e PA Code		
Requesting Data			Name of PTL	
Unit	[m3/kg]		Data Category	near _ field
Was Data Develope	ed under the KAERI QA I	Program?	E (Y:Under KAERI QAP, E:Exis	iting Data)
Name of PM			Date of the Latest PM Approv	2004-11-12
Relevant QA Procedure	es QAP 17−1		In case	of the data in reference materials
				Sines the Existing data
		Data	Viewing the related	I information on QA
QA Document No.	PA_001			
Date of Data Generation				
	Distribution Type			
	QE paraantila			
	25 percentile			
Data Value	50 percentile	5		
Data Value	50 percentile median	5		
Data Value	50 percentile median 75 percentile	5		
Data Value	50 percentile median 75 percentile 100 percentile	5		
Data Value Number of Data Point	50 percentile median 75 percentile 100 percentile	5		
Data Value Number of Data Point Name of Recorder	50 percentile median 75 percentile 100 porcontile	5 vang	Quotation from the re	ference materials
Data Value Number of Data Point Name of Recorder Reference	25 percentile 50 percentile median 75 percentile 100 porcentile Yongsoo Hv H12 Supporting Repor	5 vang t Table 6.1.2.2	Quotation from the re	ference materials





Procedures for disposal R&D

- QA principles related to atomic energy in 10CFR50 appendix B are modified and optimized to HLW disposal R&D.
- Based on this quality assurance procedures and related forms has been developed for application.





Project Generation



QA Procedures

			🕘 Wel	come To KAERI -	Microsoft Internet 🔳 🗖 🔀	
Name	Procedures [Opened : 🗹]		• (onflow_check.hwp -		
Date	04-11-05		4			
Document Number	Pro				Close >>	
Description	소프트웨어 관련 절차					
Project Leaders	강철형					
Project Members	강철형 박정균 김천수 조동건 배대석 서운진 최희주 웅 미종열 전관식 김경수 박경우 김건영 백민훈 한필 조원진 고용권 이연명 황용수	박정화 이재완 최종원 한지웅 김진 2수 김성기 권상기 김승수 이승엽	Document H	ander : Pro006	Date : 2004-04-03 18:54	
Jsed Form					2月27日 2月21	
			3		History	
FormID Document Num	aber Revision Title	Date Author Actions				
form0501a Pro006	Cooncetflow version upgrade 체크 사항 (06-06-03 18:54 ejseo Edi View Fil			06-06-02 18:57 06-06-02 18:57	
\mathbf{X}					202	
Search :					1.54	
Document litte		Search				
	Records Submittal Form (Q&P 17-1, Rev.D, Appendix &1)				462 96-06-03 11-00	
				Document Title : Conncettlew version	upgrade 潮⊡ 시성	
Polic american information 1 human		Vale : 208-08-03 1754		Title	Deuription	
2				Concetflow rendon upgrade	Attached Files	
				Inte	Author Description	
				contracting	Commit 2	
		문전자		Author	Connects	
				ejteo Conrec	1 : Approved Forms	
					2 . Now Innut Form	
					2: New Input Form	
forward Trip						
Document Title	Attach a file	-			3 : View a Contents	
Document Title	Attach a file Anter Decription	_			3 : View a Contents in a Form	
Document Title Tale	Attach a file Autor Decemption Conserved: : •				3 : View a Contents in a Form	
Document Title Tele	Attack a file Antie Deception Connects: - Antier Canacest				3 : View a Contentsin a Form4 : View a Attached	



Korea Atomic Energy Research Institute

Searching the Data



Assessment methods

flow chart in FEAS

development of PA

Input database

Korea Atomic Energy Research Institute

in the web based

QA system

International Workshop on KMS, Tokyo, Japan, 2009

Future Works : CYPRUS +

- Update on documentation system
- PID for scenario development
- PAID for in situ experiments and fracture networks
- Element Diagram for Groundwater (concentration of species in groundwater)



Korea Atomic Energy Research Institute

International Workshop on KMS, Tokyo, Japan, 2009