



U.S. Department of Energy
Office of Civilian Radioactive Waste Management



Project Update Exhibits

Presented to:
Nuclear Waste Technical Review Board

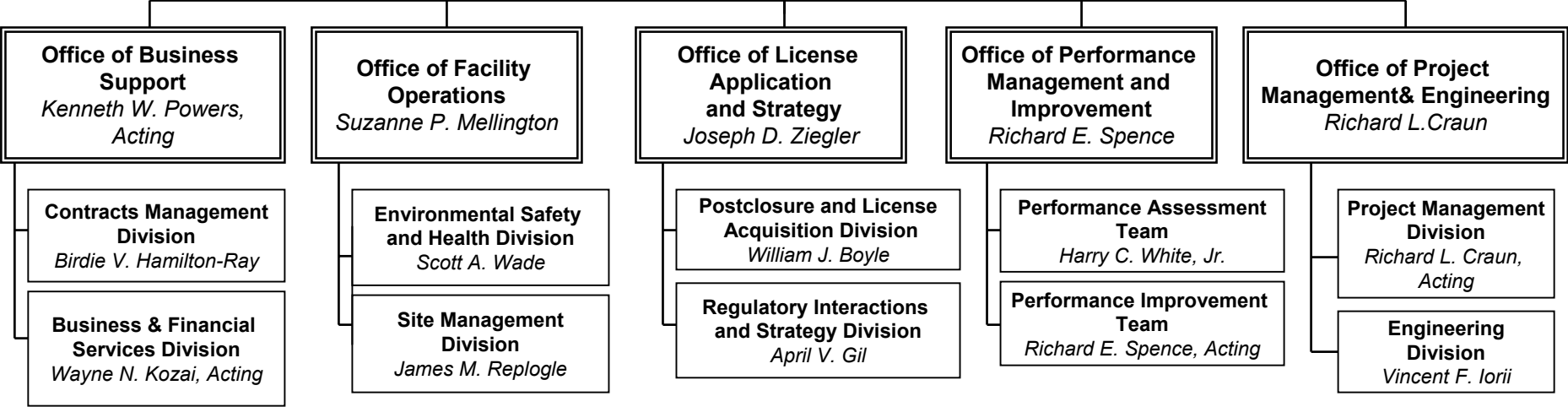
Presented by:
W. John Arthur, III
Deputy Director, Office of Repository Development
U.S. Department of Energy

May 18, 2004
Washington, DC

Office of Repository Development

Office of Repository Development
W. John Arthur, III, Deputy Director
Kenneth W. Powers, Associate Deputy Director
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- *Susan L. Rives, Chief Counsel*
- *Allen B. Benson, Communications*
- *(Vacant), OCRWM Concerns Program*
- *Mark E. Van Der Puy, Safety Conscious Work Environment*
- *(Vacant), Inter-Governmental Relations*



Management Assessment of Progress Towards License Application

COMPONENT	PERCENT COMPLETE (January 2004)	PERCENT COMPLETE (April 2004)
KTI Agreement Addressed*	70%	70%
LA Document	14%	33%
Preclosure Safety Assessment	45%	62%
TSPA-LA	76%	81%
Design	<u>56%</u>	<u>79%</u>
TOTAL WEIGHTED PERCENT COMPLETE	54%	68%

100 percent of Key Technical Issue (KTI) Agreements will be addressed prior to submission of the LA.

* Status reflected as percent of 293 agreements with complete DOE submittals.



Key Technical Issues Agreements Status Summary

Reflects Activity through April 28, 2004

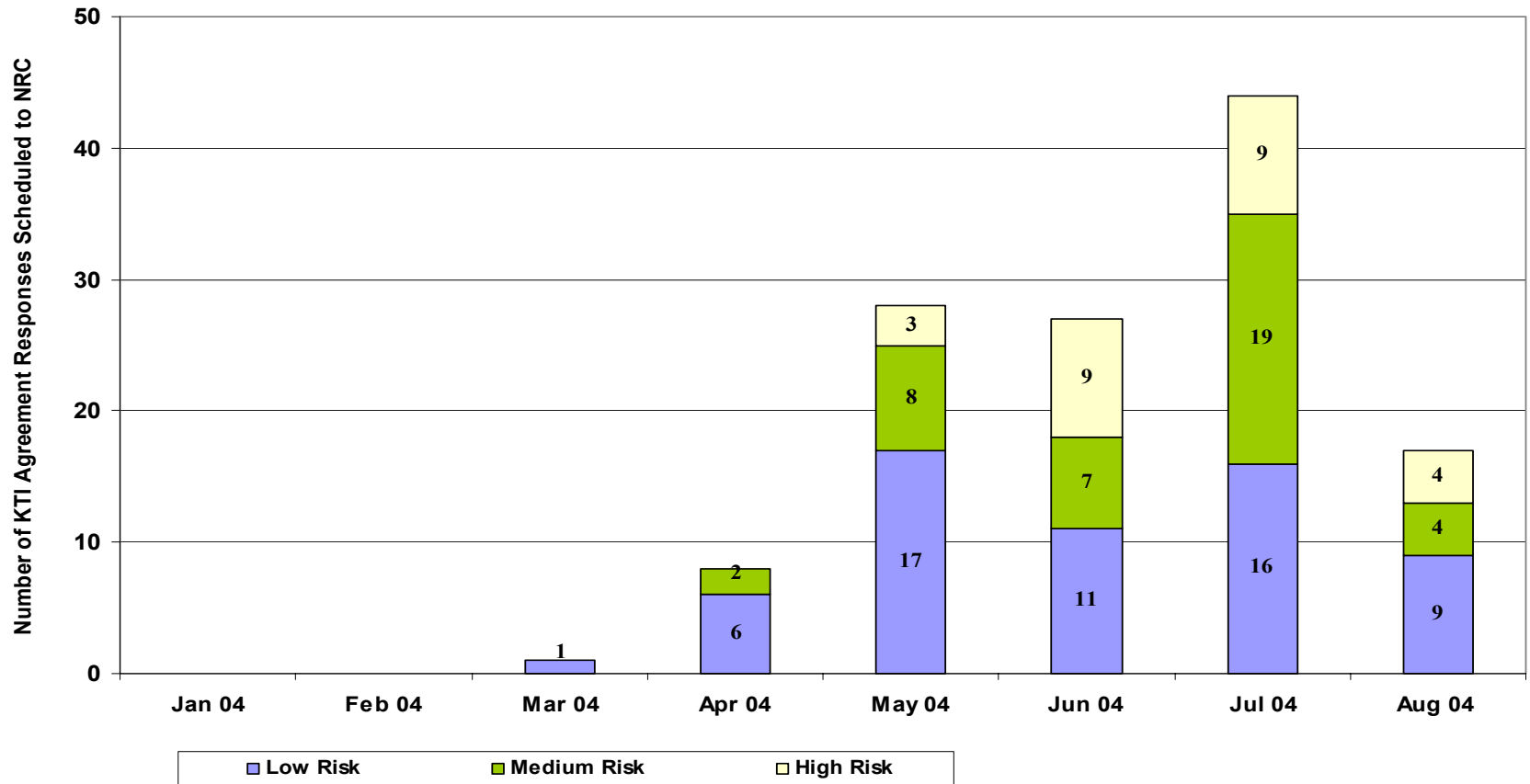
KTI ID	Agreements Reached	Agreements Submitted to NRC	Responses Submitted In NRC Review	Partial Responses Submitted	NRC Needs Additional Information	Responses Remaining to be Submitted	Agreements Complete
CLST	58	41	10	3	8	17	20
ENFE	41	37	18	5	1	4	13
GEN	1	1	0	1	0	0	0
IA	22	20	7	0	0	2	13
PRE	9	6	1	0	3	3	2
RDTME	23	4	2	1	0	19	1
RT	29	22	15	1	0	7	6
SDS	10	10	0	3	2	0	5
TEF	15	13	3	1	2	2	7
TSPAI	58	35	10	2	9	23	14
USFIC	27	25	4	0	3	2	18
Total =	293	214	70	17	28	79	99

Total responses to be submitted to NRC for closure (remaining responses, partial responses, and AIN's) = 124



Key Technical Issue Agreements

KTI Agreements - NRC Risk Ranking Per Month (April 04 Schedule)



License Application Document Structure

General Information (GI)

Approximately 400 pages

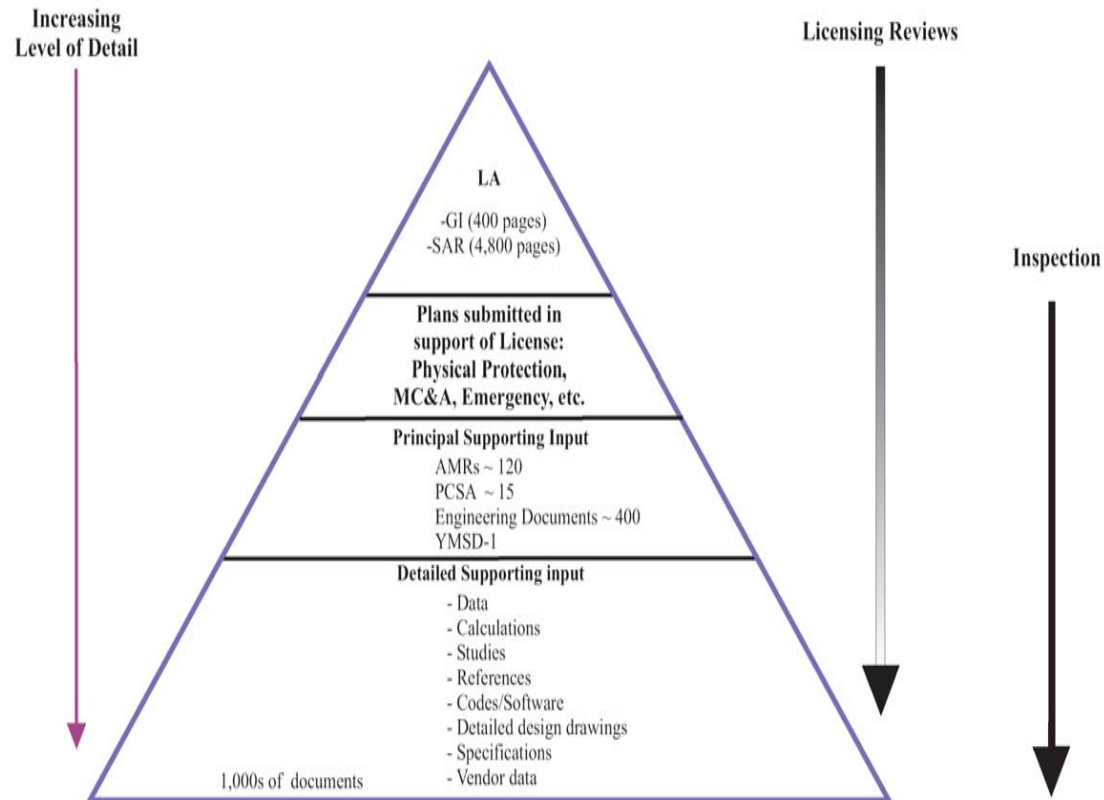
- 1 General Description
- 2 Proposed Schedules For Construction, Receipt And Emplacement Of Waste
- 3 Physical Protection Plan
- 4 Material Control And Accounting Program
- 5 Site Characterization

Safety Analysis Report (SAR)

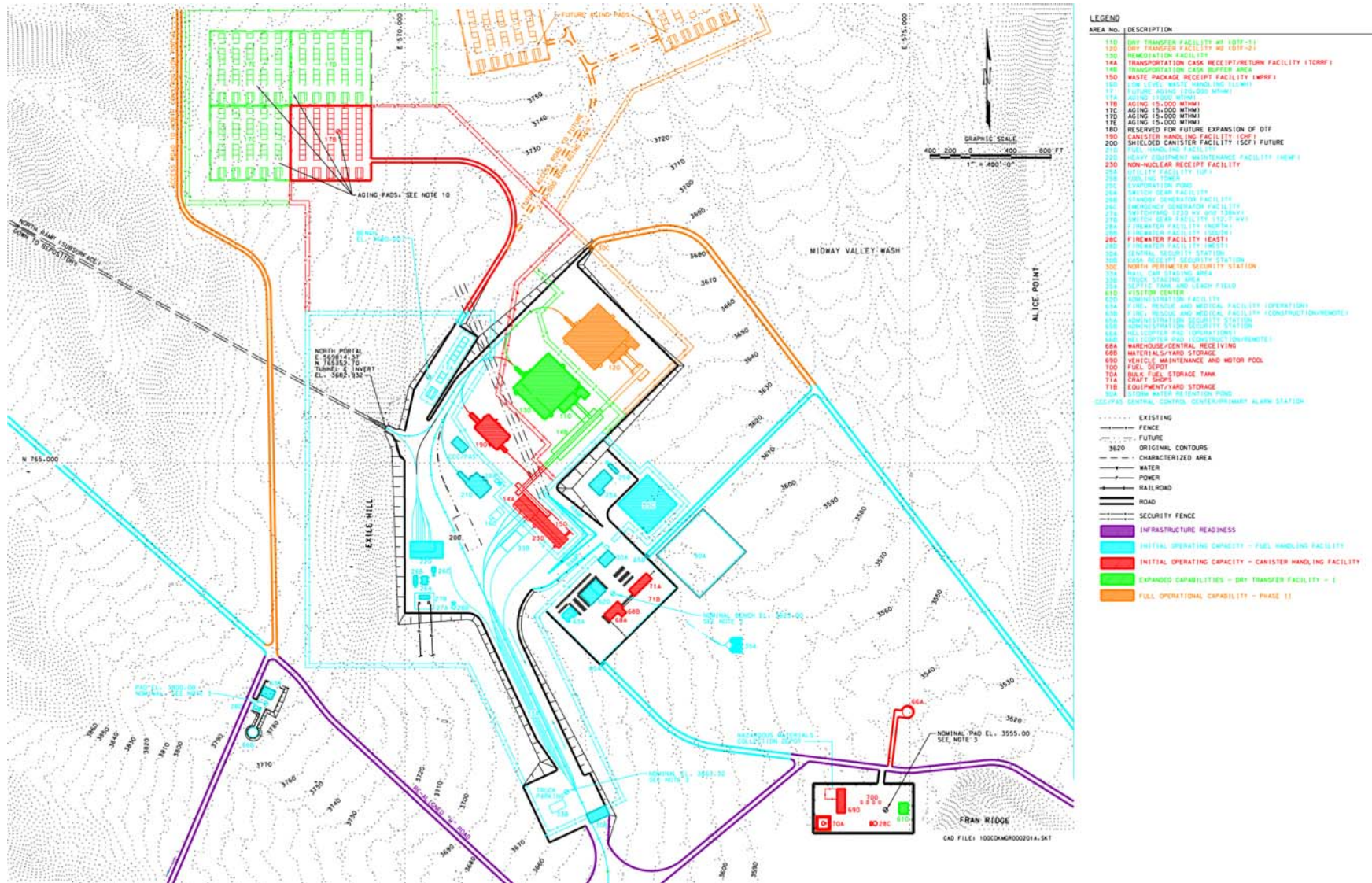
Approximately 4,800 pages

- 1 Repository Safety Before Permanent Closure
- 2 Repository Safety After Permanent Closure
- 3 Research And Development Program To Resolve Safety Questions
- 4 Performance Confirmation Program
- 5 Administrative And Programmatic Requirements

License Application and Supporting Documents



Current Surface Facilities Layout



Total System Performance Assessment Component Models and Analysis Model Reports

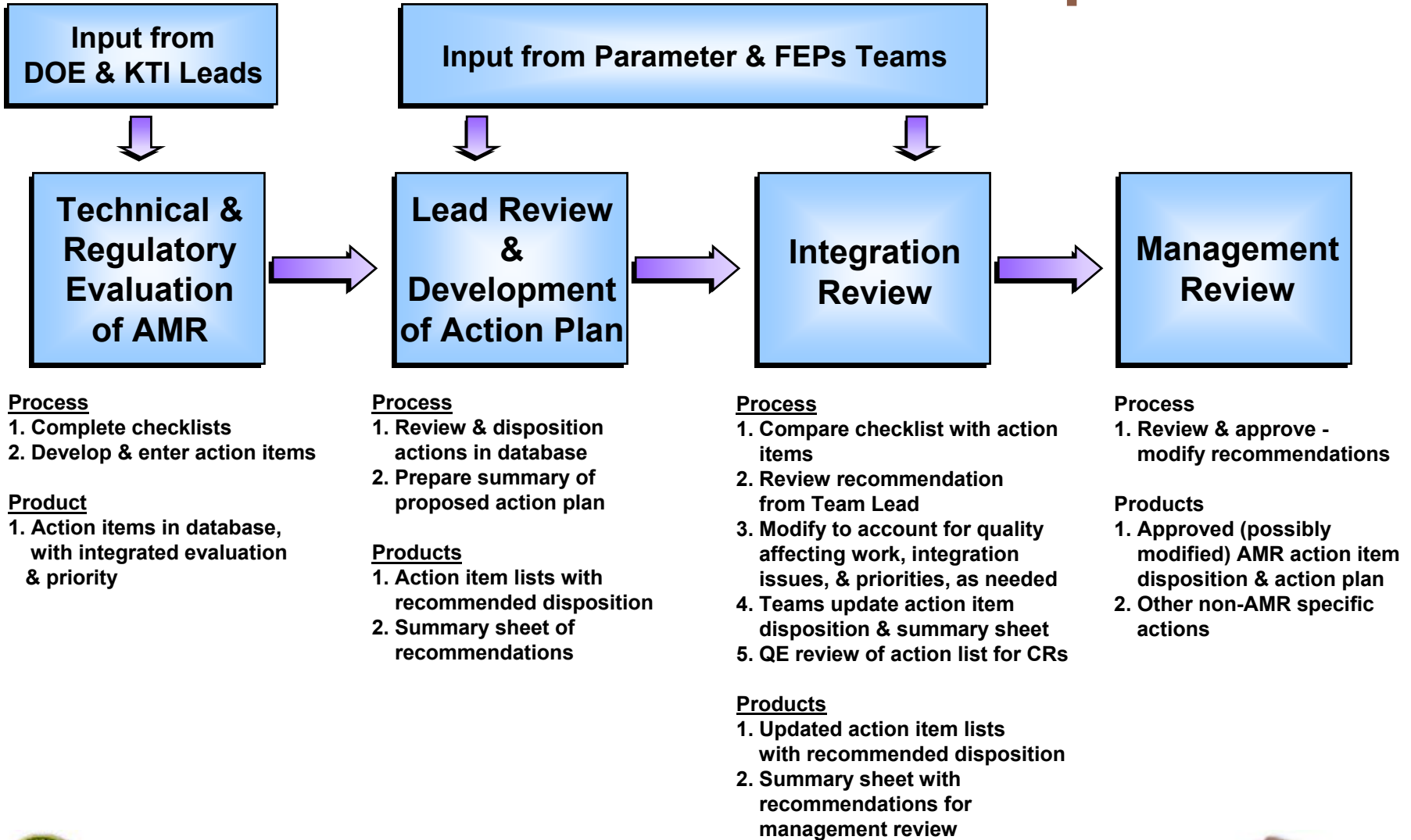
Unsaturated Zone Flow		Engineered Barrier System Environment		Waste Package Degradation	Waste Form Degradation & Mobilization		Engineered Barrier Flow & Transport	Unsaturated Zone Transport	Saturated Zone Flow & Transport	Biosphere	Disruptive Events Igneous Scenario Class	Disruptive Events Seismic Scenario Class	
Future Climate Analysis ANL-NBS-GS-00008	3-D UZ S/S Model Grid ANL-NBS-HS-00015	Drift Scale TH/CTHM Abstraction MDL-NBS-HS-00018	Drift Scale TH/CTHM Abstraction MDL-NBS-HS-00018	Drift Scale TH/CTHM Abstraction MDL-NBS-HS-00018	Aging & Phase Stability of WP Outer Barrier ANL-EBS-MD-00002	Initial Cladding Condition ANL-EBS-MD-00048	In Situ Field Testing of Processes ANL-NBS-HS-00005	Drift Scale TH/CTHM Abstraction MDL-NBS-HS-00018	3-D UZ S/S Model Grid ANL-NBS-HS-00015	SZ Transport Method & Component Integration MDL-NBS-HS-00010	Evaluation of Applicability of Biosphere-Related FEPS ANL-MGR-MD-00011	Characterize Framework for Seismic Deform ANL-CRW-GS-00003	Characterize Framework for Seismic Deform ANL-CRW-GS-00003
In Situ Field Testing of Processes ANL-NBS-HS-00005	In Situ Field Testing of Processes ANL-NBS-HS-00005	In Situ Field Testing of Processes ANL-NBS-HS-00005	Seepage Model for PA Including Drift Collapse MDL-NBS-HS-00002	Drift Scale Cpld Processes (DST-THC Seepage) Models MDL-NBS-HS-00001	General & Localized Corrosion of WP Outer Barrier ANL-EBS-MD-00003	Initial Radioactive Inventory ANL-WIS-MD-00020	AMR (WF Colloid Source Term) ANL-WIS-MD-00012	Drift Scale Cpld Processes (DST-THC Seepage) Models MDL-NBS-HS-00001	In Situ Field Testing of Processes ANL-NBS-HS-00005	SZ Colloid Facilitated Transport ANL-NBS-HS-00010	Characteristics of Receptor for Biosphere Model ANL-MGR-MD-00005	Framework for Igneous Activity ANL-MGR-GS-00001	Fault Displacement Effects On Transport in the UZ ANL-NBS-HS-00020
Analysis of Hydrologic Properties Data MDL-NBS-HS-00014	Calibrated Properties Model MDL-NBS-HS-00003	Calibrated Properties Model MDL-NBS-HS-00003	Min-Scale Coupled Process (TH/CTHM) MDL-NBS-HS-00007	Abstraction of Drift Seepage MDL-NBS-HS-00019	HWPD (WAPEEG) Analysis of WP and Drift Shield Degradation ANL-EBS-PA-00001	Clad Degradation - FEPS Screening Arguments ANL-WIS-MD-00008	WF Colloid Source Term ANL-EBS-PA-00004	Thermal Testing Data ANL-NBS-HS-00041	Calibrated Properties Model MDL-NBS-HS-00003	Geochemical & Isotopic Constraints on GW Flow ANL-NBS-HS-00021	Groundwater Usage by Proposed Farming Community ANL-MGR-MD-00008	Dike/Drift Interactions MDL-MGR-GS-00005	Effects of Fault Displacement On Employment Drifts ANL-EBS-GE-00004
Analysis of Infiltration Uncertainty ANL-NBS-HS-00027	UZ Flow Models & Submodels MDL-NBS-HS-00006	UZ Flow Models & Submodels MDL-NBS-HS-00006	FEPS in UZ F&T ANL-NBS-MD-00001	Analysis of Geochemical Data for UZ ANL-NBS-HS-00017	FEPS Screening of Processes & Issues of DS/WP Degradation ANL-EBS-PA-00002	Piling Model for Zirconium Alloyed Cladding ANL-EBS-MD-00008	In-WF FEPS Screening ANL-WIS-MD-00009	Drift Scale radionuclide Transport MDL-NBS-HS-00016	UZ Flow Models & Submodels MDL-NBS-HS-00006	Calibration of the Site-Scale SZ Flow Model MDL-NBS-HS-00011	Installation Input Parameters for Biosphere Model ANL-MGR-MD-00001	Characterize Enruptive Processes ANL-MGR-GS-00002	Evaluate/Screen Technics ANL-NBS-HS-00005
FEPS in UZ F & T ANL-NBS-MD-00001	Analysis of Hydrologic Properties Data MDL-NBS-HS-00014	Seepage Model for PA Including Drift Collapse MDL-NBS-HS-00002	DS THM Coupled Process MDL-NBS-HS-00017	Thermal Testing Data ANL-NBS-HS-00041	Environment on Surfaces of DS/WP Outer Barrier ANL-EBS-MD-00001	CSMF Waste Form Degradation Model ANL-EBS-MD-00016	DS Cpld Processes (DST&TH Seepage) Models MDL-NBS-HS-00015	Radionuclide Transport Models Under Ambient Cond MDL-NBS-HS-00008	Input & Results Base Case SZ F&T Model TSPA MDL-NBS-HS-00012	Ag & Env Input Parameters for Biosphere Model ANL-MGR-MD-00008	Number of Waste Packages Hit by Igneous Intrusion ANL-MGR-GS-00003	Seismic Design Ground Motion Inputs MDL-MGR-GS-00003	
Sim. of Net Infiltration for Modern & Future Climate ANL-NBS-HS-00032	Min-Scale Coupled Process (TH/CTHM) MDL-NBS-HS-00007	Seepage Calibration Model & Testing Data MDL-NBS-HS-00004	Rock Properties Model MDL-NBS-GS-00004	Drift-Scale radionuclide Transport MDL-NBS-HS-00016	Generalized & Localized Corrosion on Drift Shield ANL-EBS-MD-00004	HLW Glass Degradation ANL-EBS-MD-00016	DS THM Coupled Process MDL-NBS-HS-00017	Particle Tracking Model/Abstr. of Transport Process MDL-NBS-HS-00020	FEPS in SZ Flow & Transport ANL-NBS-HS-00002	Env Trans Input Parameters for Biosphere Model ANL-MGR-MD-00007	Atmospheric Dispersal & Disposition MDL-MGR-GS-00002	Seismic Topical Report #3 TDR-MGR-GS-00001	
FEPS in UZ F&T ANL-NBS-MD-00001	Analysis of Hydrologic Properties Data MDL-NBS-HS-00014	Minerologic Model MDL-NBS-GS-00003	DS Cpld Processes (DST&TH Seepage) Models MDL-NBS-HS-00015	SOC of DS, WP Outer Barrier & SS Street Material ANL-EBS-MD-00005	DSMF and Other WF Degradation Abstraction ANL-WIS-MD-00004	DSMF and Other WF Degradation Abstraction ANL-WIS-MD-00004	Cp & Thermal Exp Analysis ANL-EBS-MD-00013	Analysis of Hydrologic Properties Data MDL-NBS-HS-00014	In Situ SZ Testing ANL-NBS-HS-00035	Evaluate Soil/RN Removal by Erosion & Leaching ANL-MGR-MD-00009	Evaluate/Screen Technics ANL-NBS-HS-00005	Seismic Consequence MDL-WIS-PA-00003	
Conceptual & Numerical Models for UZ F&T MDL-NBS-HS-00005	Min-Scale Coupled Process (TH/CTHM) MDL-NBS-HS-00007	Effects of Fault Displacement On Employment Drifts MDL-EBS-GE-00004	DS THM Coupled Process MDL-NBS-HS-00017	Hydrogen Induced Cracking Of the Drift Shield ICN ANL-EBS-MD-00006	WF Igneous Intrusion MDL-EBS-GS-00002	WF Igneous Intrusion MDL-EBS-GS-00002	Drift Degradation Analysis ANL-EBS-MD-00027	FEPS in UZ F&T ANL-NBS-MD-00001	Hydrologic Framework Model ANL-NBS-HS-00033	DE Biosphere Dose Conversion Factor Analysis ANL-MGR-MD-00003	WF Igneous Intrusion MDL-EBS-GS-00002		
Analysis of Geochemical Data for UZ ANL-NBS-HS-00017	Drift Scale Cpld Processes (DST-THC Seepage) Models MDL-NBS-HS-00001	Evaluate/Screen Technics ANL-WIS-MD-00005	Thermal Conductivity of Non-Repository Lithostratigraphic Layer MDL-NBS-GS-00006	Ventilation Model ANL-EBS-MD-00030	Dissolved Concentrations of Radioactive Elements ANL-WIS-MD-00010	Dissolved Concentrations of Radioactive Elements ANL-WIS-MD-00010	Drift Degradation Analysis ICN Static Fatigue ANL-EBS-MD-00027	Conceptual & Numerical Models for UZ F&T MDL-NBS-HS-00005	Water-Level Data Anal For SZ Site-Scale F&T Model ANL-NBS-HS-00034	Nominal Performance Bas Dose Conversion Factor Analysis ANL-MGR-MD-00009	Biosphere Model Report MDL-MGR-MD-00001		
UZ Flow Patterns & Analysis (Realistic Case) MDL-NBS-HS-00012	Abstraction of Drift Properties Data MDL-NBS-HS-00019	Seismic Design Ground Motion Inputs MDL-MGR-GS-00003	Cp & Thermal Exp Seepage ANL-EBS-MD-00013	Physical Chemical Environment Model ANL-EBS-MD-00033	AMR (WF Colloid Source Term) ANL-WIS-MD-00012	AMR (WF Colloid Source Term) ANL-WIS-MD-00012	Invert Advection vs Diffusion Analysis ANL-EBS-MD-00003	Analysis of Geochemical Data for UZ ANL-NBS-HS-00017	Modeling Sub/Grout Scale Dispersion in 3D Hetero ANL-NBS-HS-00022	Biosphere Model Report MDL-MGR-MD-00001			
Geologic Framework Model MDL-NBS-GS-00002	FEPS in UZ F&T ANL-NBS-MD-00001	Seismic Topical Report #3 TDR-MGR-GS-00001	Thermal Conductivity MDL-NBS-GS-00005	Precipitates & Salts Analysis (incl. Thermo. Database) ANL-EBS-MD-00045	WF Colloid Source Term ANL-EBS-PA-00004	WF Colloid Source Term ANL-EBS-PA-00004	Ventilation Model ANL-EBS-MD-00030	Drift Scale radionuclide Transport MDL-NBS-HS-00016	Probability Distribution for Flowing Interval Spacing ANL-NBS-MD-00003				
Rock Properties Model MDL-NBS-GS-00004	Conceptual & Numerical Models for UZ F&T MDL-NBS-HS-00005	Drift Degradation Analysis ANL-EBS-MD-00027	FEPS Screen of Processes & Issues in DS/WP Degrad ANL-EBS-PA-00002	EBS FEPS Degradation Modes Abstraction ANL-WIS-PA-00002	Cladding Summary Abstraction ANL-WIS-MD-00021	Cladding Summary Abstraction ANL-WIS-MD-00021	Sampling of Stochastic Input Parameters ANL-EBS-PA-00009	Geologic Framework Model MDL-NBS-GS-00002	Uncertainty Distribution for Stochastic Parameters ANL-NBS-MD-00011				
Minerologic Model MDL-NBS-GS-00003	Analysis of Geochemical Data for UZ ANL-NBS-HS-00017	Drift Degradation Analysis ICN Static Fatigue ANL-EBS-MD-00027	Env on Surfaces of DS/WP Outer Barrier ANL-EBS-MD-00001	Multiscale Thermo/hydrologic Model ANL-EBS-MD-00049	In-Package Chemistry Abstraction ANL-EBS-MD-00037	In-Package Chemistry Abstraction ANL-EBS-MD-00037	EBS Radionuclide Transport Abstraction ANL-EBS-MD-00001	Rock Properties Model MDL-NBS-GS-00004					
	UZ Flow Patterns & Analysis (Realistic Case) ANL-WIS-PA-00002	EBS FEPS Degradation Modes Abstraction ANL-WIS-PA-00002	Dissolved Concentrations of Radioactive Elements ANL-WIS-MD-00010	In-Drift Natural Convection & Condensation MDL-EBS-MD-00001	In-WF FEPS Screening ANL-WIS-MD-00009	In-WF FEPS Screening ANL-WIS-MD-00009	Physical Chemical Environment Model ANL-EBS-MD-00033	Minerologic Model MDL-NBS-GS-00003					
	Thermal Testing Data ANL-NBS-HS-00041	Seismic Consequence MDL-WIS-PA-00003	AMR (WF Colloid Source Term) ANL-WIS-MD-00012				Precipitates & Salts Analysis (incl. Thermo. Database) ANL-EBS-MD-00045	Fault Displacement Effects on Transport in the UZ ANL-NBS-HS-00020					
	Drift Scale radionuclide Transport MDL-NBS-HS-00016		WF Colloid Source Term ANL-EBS-PA-00004				EBS FEPS Degradation Modes Abstraction ANL-WIS-PA-00002						
	DS Cpld Processes (DST&TH Seepage) Models MDL-NBS-HS-00015		In-Package Chemistry Abstraction ANL-EBS-MD-00037				Multiscale Thermo/hydrologic Model ANL-EBS-MD-00049						
	DS THM Coupled Process MDL-NBS-HS-00017		In-WF FEPS Screening ANL-WIS-MD-00009				In-Drift Natural Convection & Condensation MDL-EBS-MD-00001						
	Thermal Conductivity of Non-Repository Lithostratigraphic Layer MDL-NBS-GS-00006		Invert Advection vs Diffusion Analysis ANL-EBS-MD-00003				Seismic Consequence MDL-WIS-PA-00003						
	Cp & Thermal Exp Analysis ANL-NBS-GS-00013		Ventilation Model ANL-EBS-MD-00030										
	Rock Properties Model MDL-NBS-GS-00004		EBS Radionuclide Transport Abstraction ANL-WIS-PA-00001										
	Minerologic Model MDL-NBS-GS-00003		Physical Chemical Environment Model ANL-EBS-MD-00033										
	Thermal Conductivity MDL-NBS-GS-00005		Precipitates & Salts Analysis (incl. Thermo. Database) ANL-EBS-MD-00045										
	Multiscale Thermo-hydrologic Model ANL-EBS-MD-00049		EBS FEPS Degradation Modes Abstraction ANL-WIS-PA-00002										
			Multiscale Thermo/hydrologic Model ANL-EBS-MD-00049										
			In-Drift Natural Convection & Condensation MDL-EBS-MD-00001										

LEGEND

- Sandia National Laboratories
- Lawrence Berkeley National Laboratory
- Lawrence Livermore National Laboratory
- Los Alamos National Laboratory
- Bechtel SAIC



Regulatory Integration Team Evaluation Process Steps



How Do **WE** Say We Are Doing Now?

SCWE

MANAGEMENT
SUPPORT

76%

WORKER
CONFIDENCE

EFFECTIVE
NORMAL
PROBLEM
RESOLUTION
PROCESSES

58%

CAP / DPO

EFFECTIVE
ALTERNATE
PROBLEM
RESOLUTION
PROCESSES

76%

OCP/ECP

EFFECTIVE
METHODS TO
DETECT AND
PREVENT
RETALIATION

DIDN'T ASK

SEPTEMBER 2003 - OCRWM SCWE SURVEY RESULTS



Where Do We Want to be in December?

SCWE

MANAGEMENT
SUPPORT

85%
(up from 76%)

WORKER
CONFIDENCE

EFFECTIVE
NORMAL
PROBLEM
RESOLUTION
PROCESSES

70%
(up from 58%)

CAP / DPO

EFFECTIVE
ALTERNATE
PROBLEM
RESOLUTION
PROCESSES

85%
(up from 76%)

OCP/ECP

EFFECTIVE
METHODS TO
DETECT AND
PREVENT
RETALIATION

100%

*None
Substantiated

Joint Leadership Council SCWE Improvement Goals



April 2004 Monthly Operating Report Annunciator Panel

Yucca Mountain Project Annunciator Panel

Performance Indicators based on data for: March 2004

Work Execution	Primary		Secondary				Focus Areas
	Y Y Y Y #	G G G Y #	G G G G	Y R R R	G G G G	R R Y Y	V V G G
Work Execution	1.1 Licensing	1.1.1 License Application Development	1.1.2 NRC Interactions	1.1.3 License Support Network Input	1.1.4 NRC Commitments	1.1.5 Key Technical Issues	FA4 Safeguards
	1.2 Engineering/Design	1.2.1 Surface Facilities	1.2.2 Subsurface Facilities	1.2.3 Engineered Barriers	1.2.4 Reqts & Integration Management		
	1.3 Safety Analysis	1.3.1 TSPA	1.3.2 Performance Confirmation	1.3.4 Preclosure Safety Analysis	1.3.5 AMR Production		
	1.4 Site Operations	1.4.1 Site Engineering	1.4.2 Site Construction	1.4.3 Site Maintenance	1.4.4 Operations	1.4.5 Bechtel Nevada	1.4.6 Site Critical Systems
Management	2.1 Project Support						
	2.2 Safety, Health, and the Environment	2.2.1 Incidents	2.2.2 ES&H Program Awareness	2.2.3 ES&H Reporting			
	2.3 Quality Assurance	2.3.1 Product Quality	2.3.2 Process Quality	2.3.3 Vendor Quality	2.3.4 Corrective Action Program Quality	2.3.5 Quality Systems	
	2.4 Corrective Action Mgmt System	2.4.1 CAP Effectiveness	2.4.2 Self Reporting Culture	2.4.3 Causal Analysis & CAP Development	2.4.4 Timely & Effective CAR		
	2.5 Management Framework	2.5.1 Procedures	2.5.2 Requirements Management	2.5.3 Management Programs			
	2.7 Project Management	2.7.1 Cost Performance (Overall CPI)	2.7.2 Schedule Performance (Overall SPI)	2.7.3 Scope Baseline	2.7.4 Risk & Contingency	2.7.5 Key Deliverable Critical Path Float	
	2.8 Organizational Climate	2.8.1 Employee Concerns	2.8.2 Safety Culture	2.8.3 SCWE	2.8.5 Internal Communicatio		
	3.1 External	3.1.2 External Communicatio	3.1.5 Funding				
	4.1 Human Performance	4.1.1 Error Prevention	4.1.2 Human Performance Awareness	4.1.3 Backlog Management	4.1.4 Learning Culture		

Key

History	▲ trend
Metric Title	

Late Indicators
* Indicates a change to metric this month.

B G Y R

A lettered history tile with a white background indicates the point at which a change occurred in the underlying metric. The performance reported in the history tiles to the left of the point of change should be used with caution. A change is defined as a change to the intent of the metric definition, threshold, weighting, calculation, data source(s) used in the calculation, or the deletion/addition of a sub-metric. Trend Indicators are based on a rolling average of six months of data. If there are not six data points because the metric is new or has been changed, then the trend is based upon the data available, or is indicated as neutral.

B Exceptional performance that exceeds all requirements and expectations for the desired outcome, maintained for more than six months.

R Degraded or adverse performance warranting significant level of management attention, resources, and improvement.

G Good performance which meets or exceeds requirements and expectations. The status code "B > G" indicates that the score would be Btus, but has not demonstrated sustained performance.

L Gray for Late - Updated metric not provided by due date.

D Approved metric not yet reporting data.

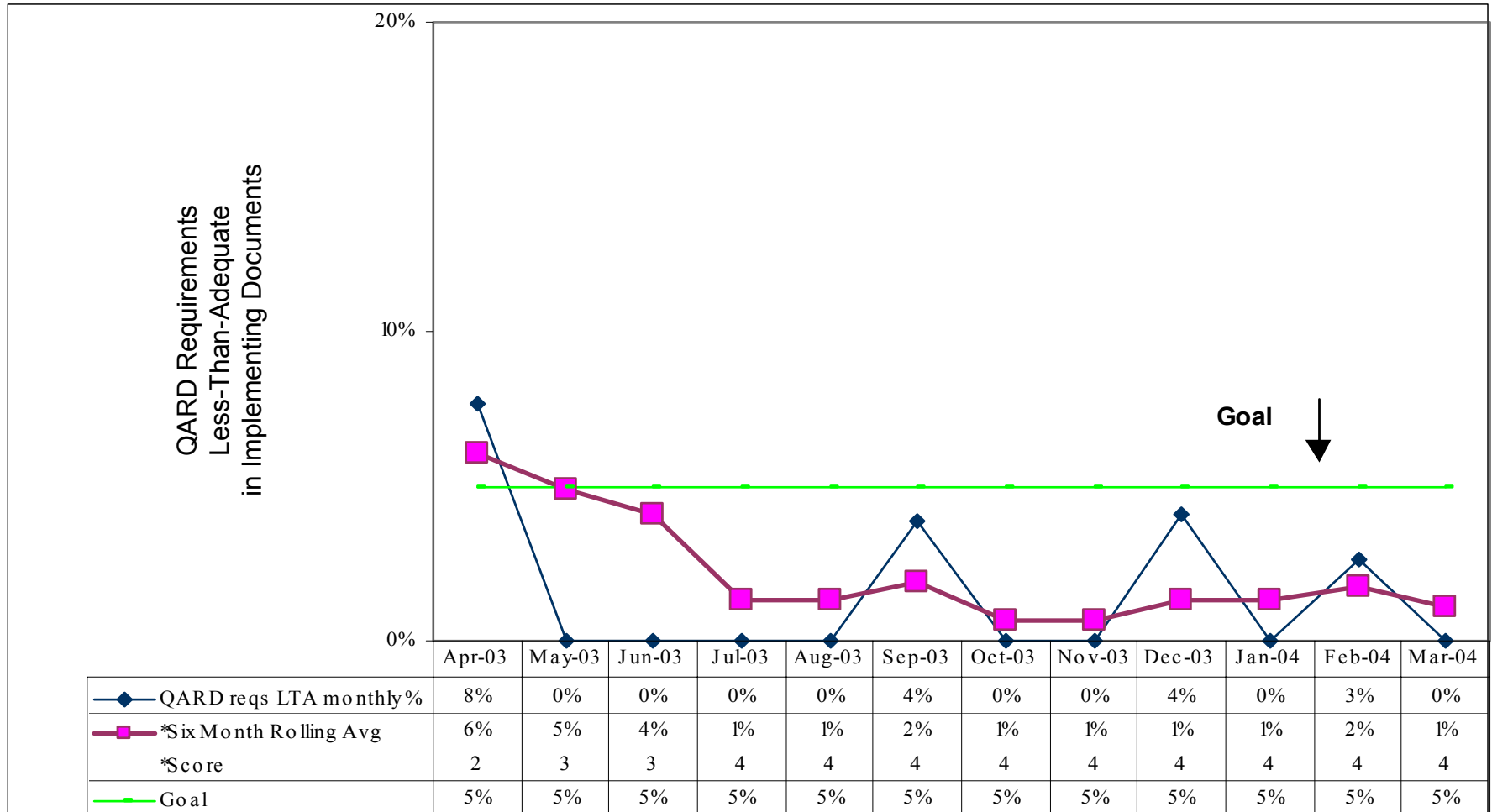
Y Yellow is used to denote:
-Performance which warrants increased management attention and resources to achieve desired results or to reverse a negative trend.
-Acceptable performance that relies on a set of conditions which could change and send performance into the "Red" category.

V Insufficient data or metric definition is not yet approved



Adequacy of Quality Assurance Requirements and Description Requirements in Implementing Documents (2.3.2.1.1)

2.3.2.1.1 Adequacy of QARD Requirements in Implementing Documents



Adequate Corrective Action Plans (2.3.4.1.2)

2.3.4.1.2 Adequate Corrective Action Plans

