

**Civilian Radioactive Waste
Management System**

Management & Operating
Contractor



TRW Environmental Safety
Systems Inc.

Multi-Purpose Canister System Westinghouse Proposed Design

**Presentation to the Nuclear Waste Technical Review Board
Arlington, VA**

**James R. Clark, Manager
MPC Project
June 14, 1995**

MPC Contractor Workscope Phase 1

- **Design large (125-ton) and small (75-ton) transportation casks with MPCs**
- **Design equipment to seal weld MPCs**
- **Design large and small storage modules for MPCs**
- **Design transfer system to transfer loaded MPCs**
 - **From reactor pool to storage modules**
 - **From storage modules to transportation casks**

MPC Contractor Workscope Phase 1

- **Prepare Preliminary Design Reports for above**
- **Conduct safety analysis and prepare reports for**
 - **Large and small transportation casks with MPC—10 CFR 71**
 - **Large and small storage modules and transfer systems with MPC—10 CFR 72**

MPC Contractor Workscope Phase 1

- **Conduct alternative design studies and prepare reports**
 - **Enhanced fuel characteristics**
 - **Stainless steel clad SNF**
 - **Long fuel**
- **Perform scale model long lead activities**
 - **Prepare scale model fabrication and test plans**
 - **Buy scale model long lead materials**

Proposal Evaluation

- **Qualification criteria**
 - **Experience in design and fabrication of NRC certified systems or equipment**
 - **Five qualified offers received**
- **Evaluation factors per RFP**
 - **Business and management—corporate experience, personnel, management plans, facilities**
 - **Technical—design, certifiability under 10 CFR 71/72, system operability and fabricability**
 - **Price**

Evaluation Process

- **Note—restrictions on disclosure until GAO issues decisions on three protests**
- **Oral discussions with each offeror**
- **Best and final offers**
- **Best value evaluation and recommendation by Source Evaluation Board**
- **Review and determination by Source Selection Authority**

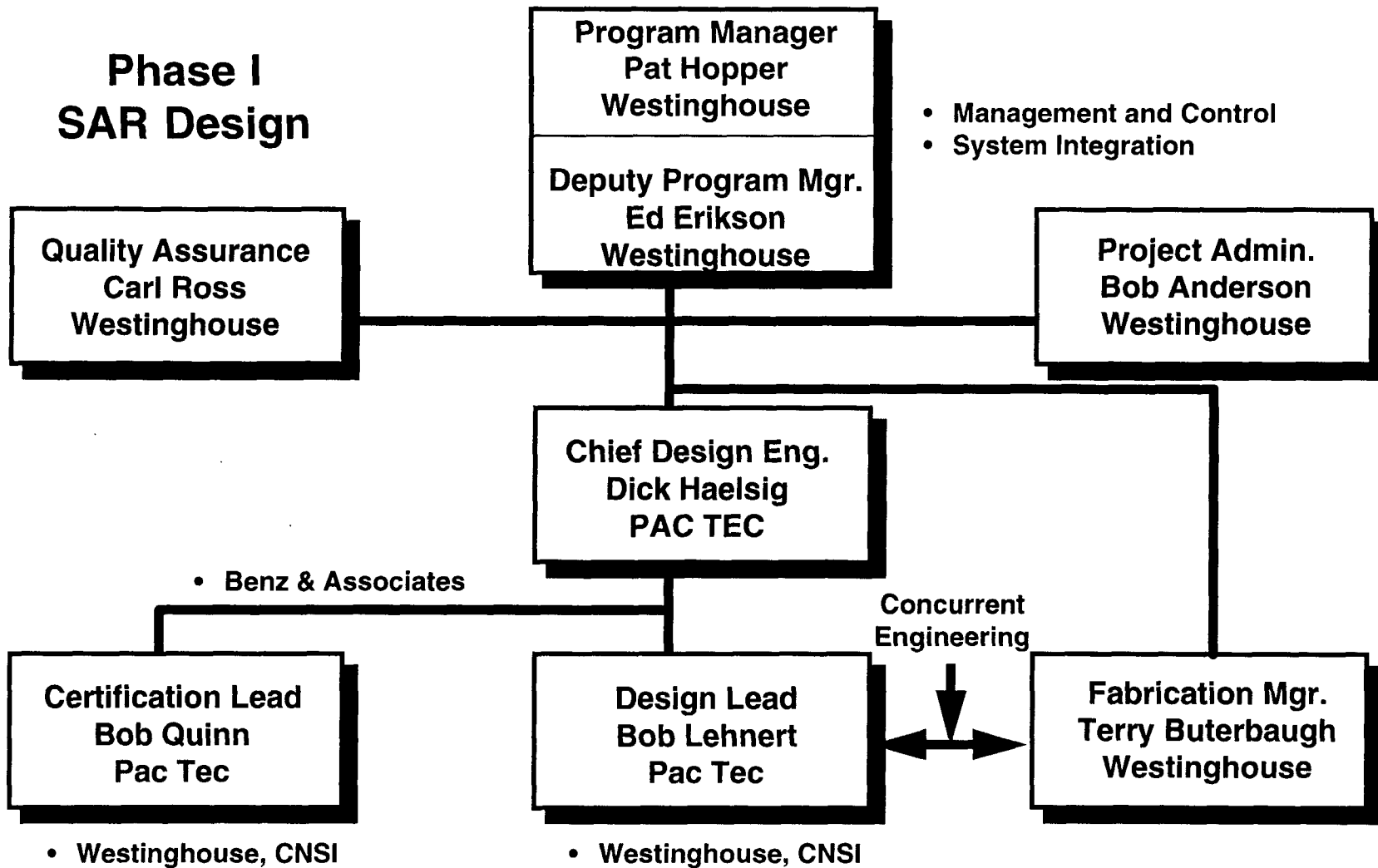
Subcontractor and Team

- **Westinghouse Government and Environmental Services Company**
- **Packaging Technology, Inc.**
- **Chem-Nuclear Systems, Inc.**

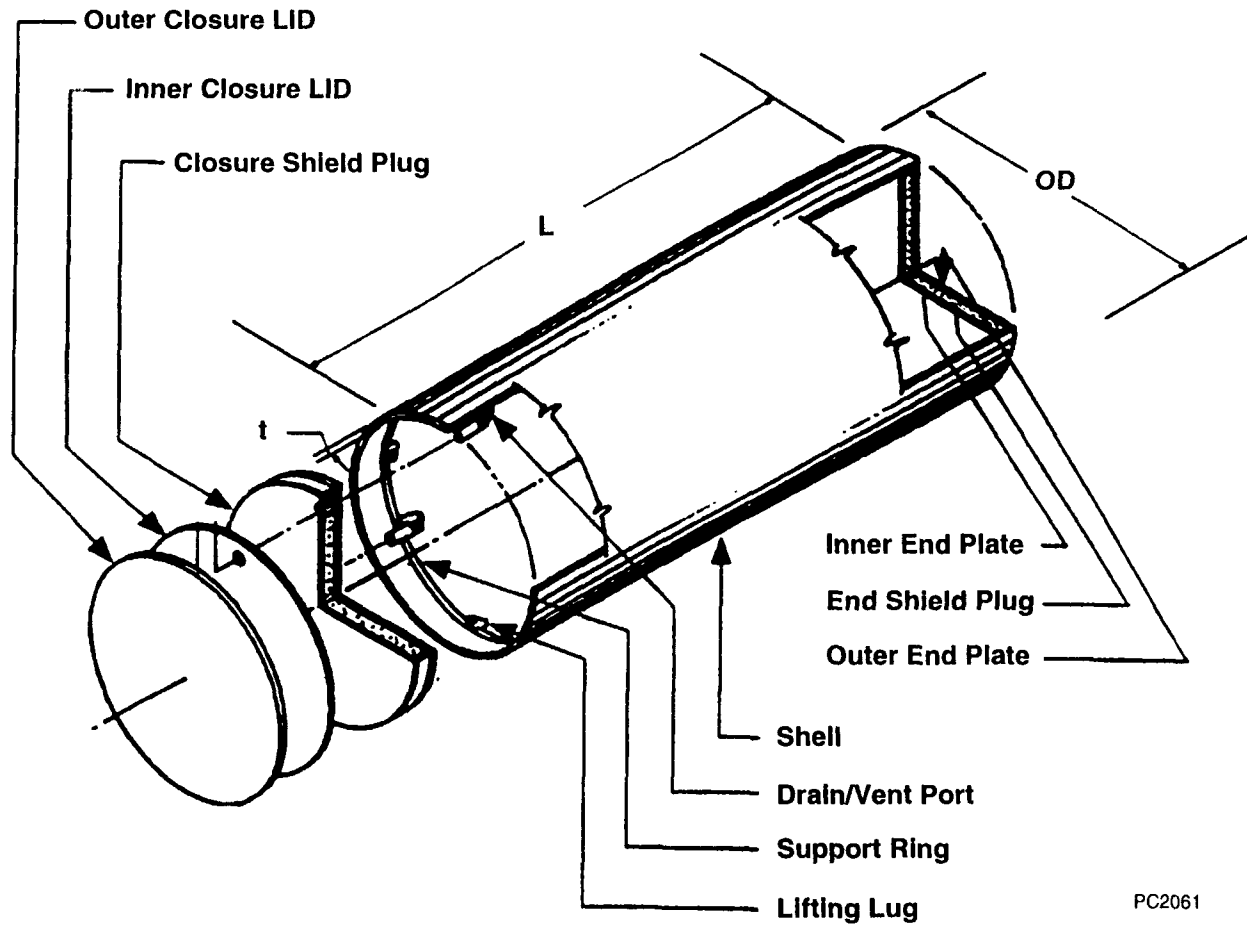
Phase 1 MPC Subcontract

- **Fixed price—\$14.0 million**
- **One-year duration**
 - **Nine months to preliminary designs**
 - **Plus 3 months to prepare SARs**

Westinghouse MPC Team Phase I Organization



Westinghouse MPC



MPC Assembly

- **Large MPC**
 - **OD—66.0 inches**
 - **Thickness—0.75 inches**
 - **Length—192 and 180 inches**
- **Small MPC**
 - **OD—50.0 inches**
 - **Thickness—0.63 inches**
 - **Length—192 and 180 inches**

MPC Assembly

- **Six cavity lengths**
- **Shield plugs**
 - **Top and bottom**
 - **Depleted uranium or carbon steel sheathed in SS**

MPC System Overview

- **MPC capacity**
 - Large PWR—21, large BWR—44
 - Small PWR—12, small BWR—24
- **MPC basket configuration—support plate with guide tubes**

MPC Basket Designs

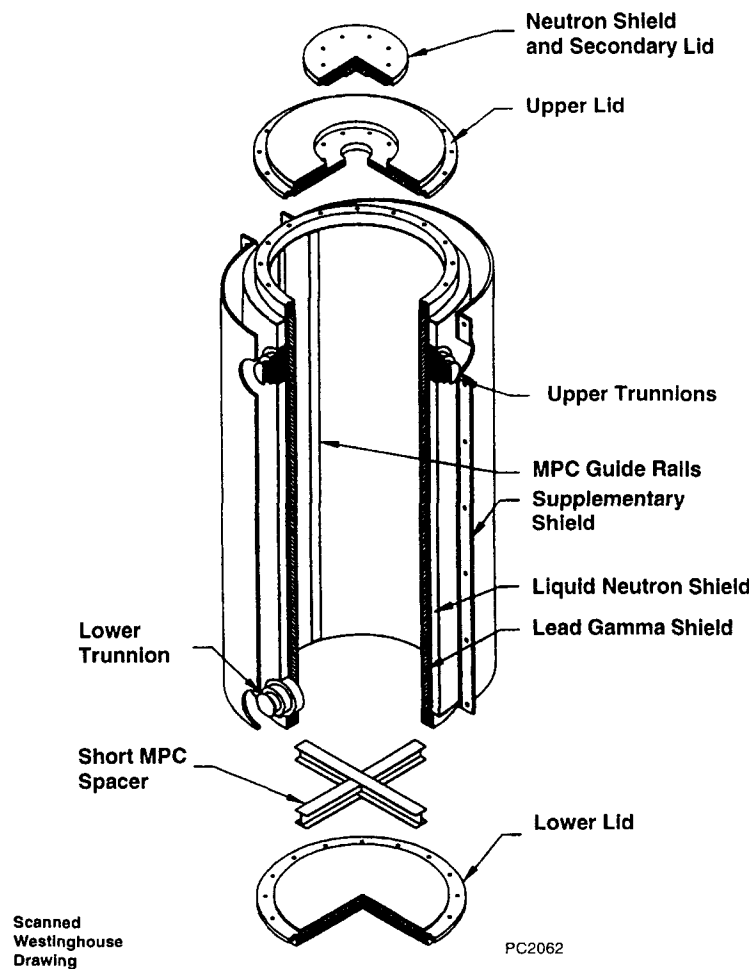
Basket Designation*	Large (125-ton)		Small (75-ton)	
	21P	44B	12P	24B
Enrichment (w/o U ²³⁵)	4.30	4.00	3.75	3.75
Burnup (GWd/MTU)	45	42	40	40
Neutron absorber material	Boral	SS-Boron	Boral	SS-Boron

* Flux trap designs

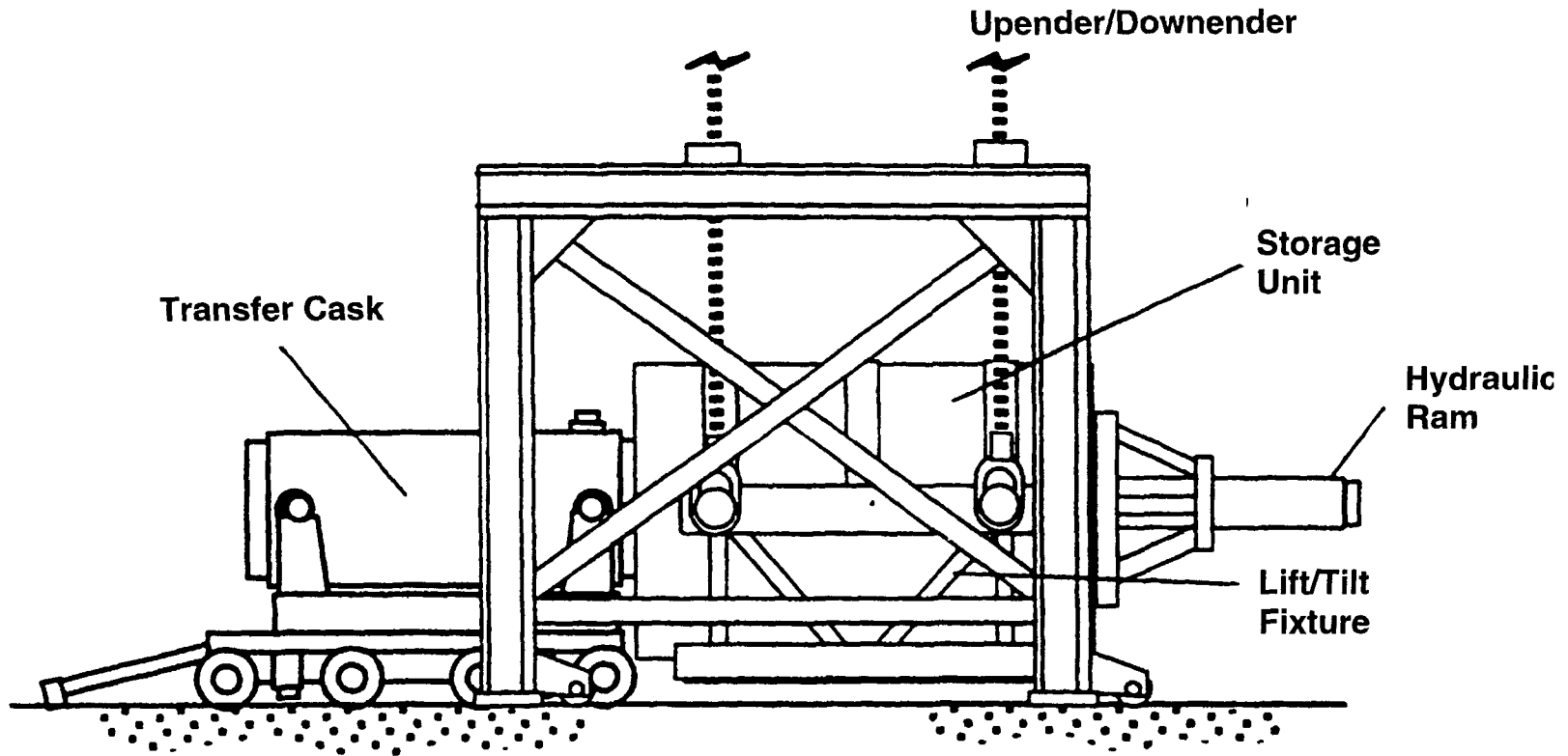
MPC System Overview

- **Storage mode—vertical pre-cast concrete**
- **Transfer—horizontal with optional vertical**

Westinghouse Transfer Cask



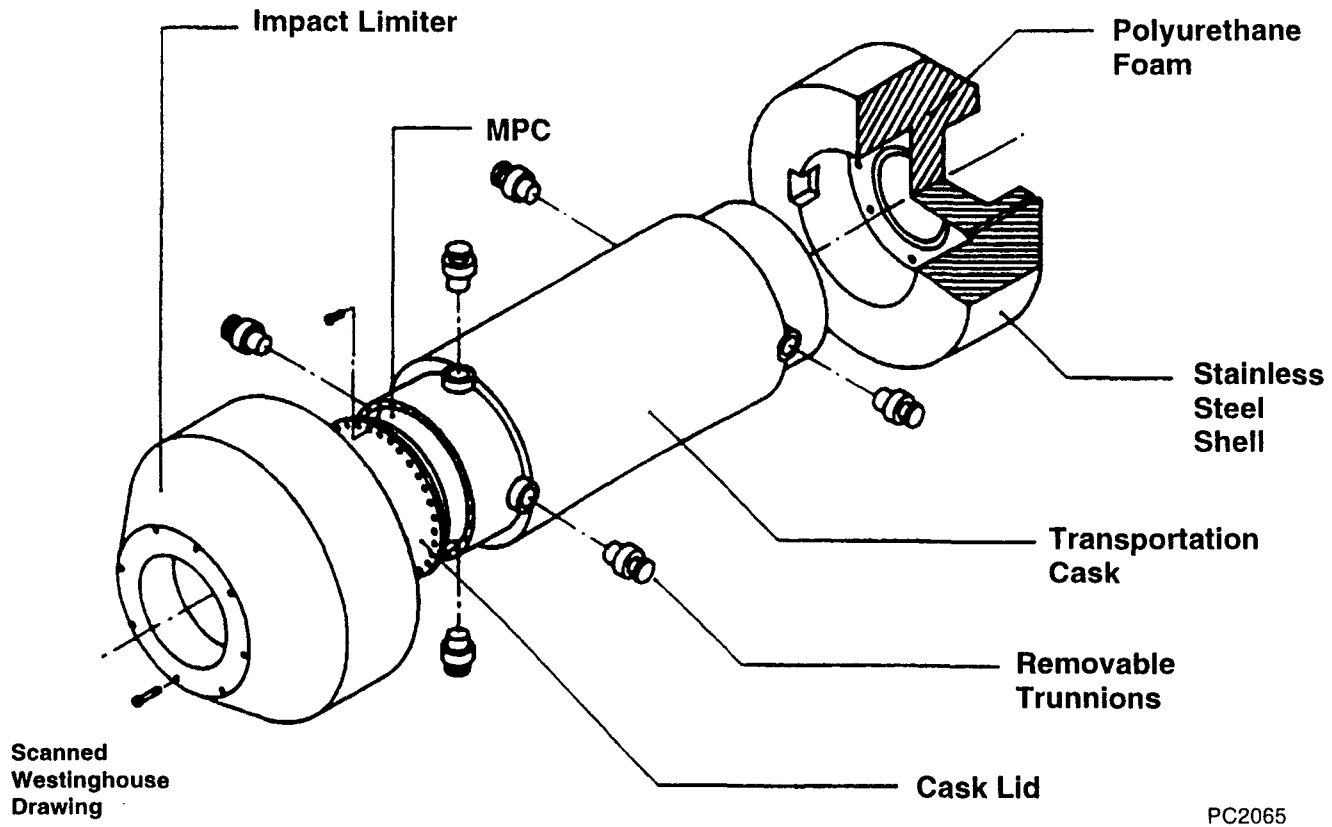
Westinghouse Transfer System



Scanned
Westinghouse
Drawing

PC2064

Westinghouse Transportation Cask



MPC System Overview

- **Transportation cask**
 - **Stainless steel containment**
 - **DU gamma shielding**
 - **NS3 neutron shielding**
 - **Polyurethane foam impact limiters**
- **Railcar—six-axle, 388,000-lb. GW, AAR approved**

Certiability—Analysis Versus Test

- **Analysis**
 - Reliance on previously accepted features
 - Fire and immersion events
 - Storage events
- **Engineering development tests (phase 1)**
 - Impact limiter attachment
 - Seal material performance

Certiability—Analysis Versus Test

- **Quarter-scale certification tests (phase 2)**
 - **Structural response to free drop and puncture events**
- **Confirmation tests**
 - **Thermal tests for storage (phase 2)**

Package Design Drivers

- **Heat loads—large MPC system**
 - **Aluminum heat removal panels installed between support plates**
 - **Large PWR and BWR only**
- **Weight constraints**
 - **Depleted uranium used in small transportation cask**
 - **Liquid neutron shield used in large transfer cask**

Criticality Control Approach

- **Westinghouse proposed flux trap design with capability of 4.3 w/o at zero burnup**
- **Design still must meet 1.8 w/o with collapsed flux trap for MGDS requirement**
- **BUC topical for PWR—Actinides only submitted to NRC May 31, 1995**

Phase I Schedule

Activity ID	Activity Description	%	Early Start	Early Finish	Total Float	1995				1996													
						M	J	S	O	N	D	J	F	M	A	M	J	J	A	N	D	J	
1000	contract start	100	25APR95A	25APR95A		X contract start																	
3410	CONCEPT REFINEMENT	0	25APR95	03AUG95	0	CONCEPT REFINEMENT																	
2110H	Develop QA plan	0	25APR95	19MAY95	0	Develop QA plan																	
GS1300H	devel. sys safety plan	0	28APR95	24JUL95	0	devel. sys safety plan																	
PT0150	NRC MEETING #1	0	19MAY95	08JUN95*	0	NRC MEETING #1																	
GS1610H	PREPARE CERT PLAN	0	31MAY95	25JUL95	0	PREPARE CERT PLAN																	
GS1140	QUARTERLY MANAGEMENT REVIEW	0		12JUL95*	0	QUARTERLY MANAGEMENT REVIEW																	
GS1300	Sys safety plan submittal	0		24JUL95*	0	Sys safety plan submittal																	
GS1610	CERTIFICATION PLAN SUBMITTAL	0		25JUL95*	0	CERTIFICATION PLAN SUBMITTAL																	
3430	PRELIMINARY DESIGN DEVELOPMENT	0	04AUG95	22JAN96	0	PRELIMINARY DESIGN DEVELOPMENT																	
5100H	1/4 Scale Fabrication Plan preparation	0	03OCT95	22JAN96	0	1/4 Scale Fabrication Plan preparation																	
1200H	Phase II fixed price proposal rev	0	22NOV95	22JAN96	0	Phase II fixed price proposal rev																	
GS1240H	AAR APPROVAL OF RAIL CAR FABRICATOR	0	12DEC95	22JAN96	0	AAR APPROVAL OF RAIL CAR FABRICATOR																	
3460	PDR REPORT FINALIZATION	0	26DEC95	22JAN96	0	PDR REPORT FINALIZATION																	
GS1450	sys safety report submittal	0		22JAN96*	0	sys safety report submittal																	
GS1460	human factors report submittal	0		22JAN96*	0	human factors report submittal																	
GS1470	issue crit op time, RAM report	0		22JAN96*	0	issue crit op time, RAM report																	
3400M	SAR Preview Presentation	0		23APR96*	0	SAR Preview Presentation																	
4000M	End Of Contract	0		26APR96*	0	End Of Contract																	

Project Start 17APR95  Early Bar
 Project Finish 28APR96  Float Bar
 Data Date 25APR95  Progress Bar
 Plot Date 02JUN95  Critical Activity

BOY3

Sheet 1 of 1

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 MULTI-PUPOSE CANISTER
 Classic Schedule Layout