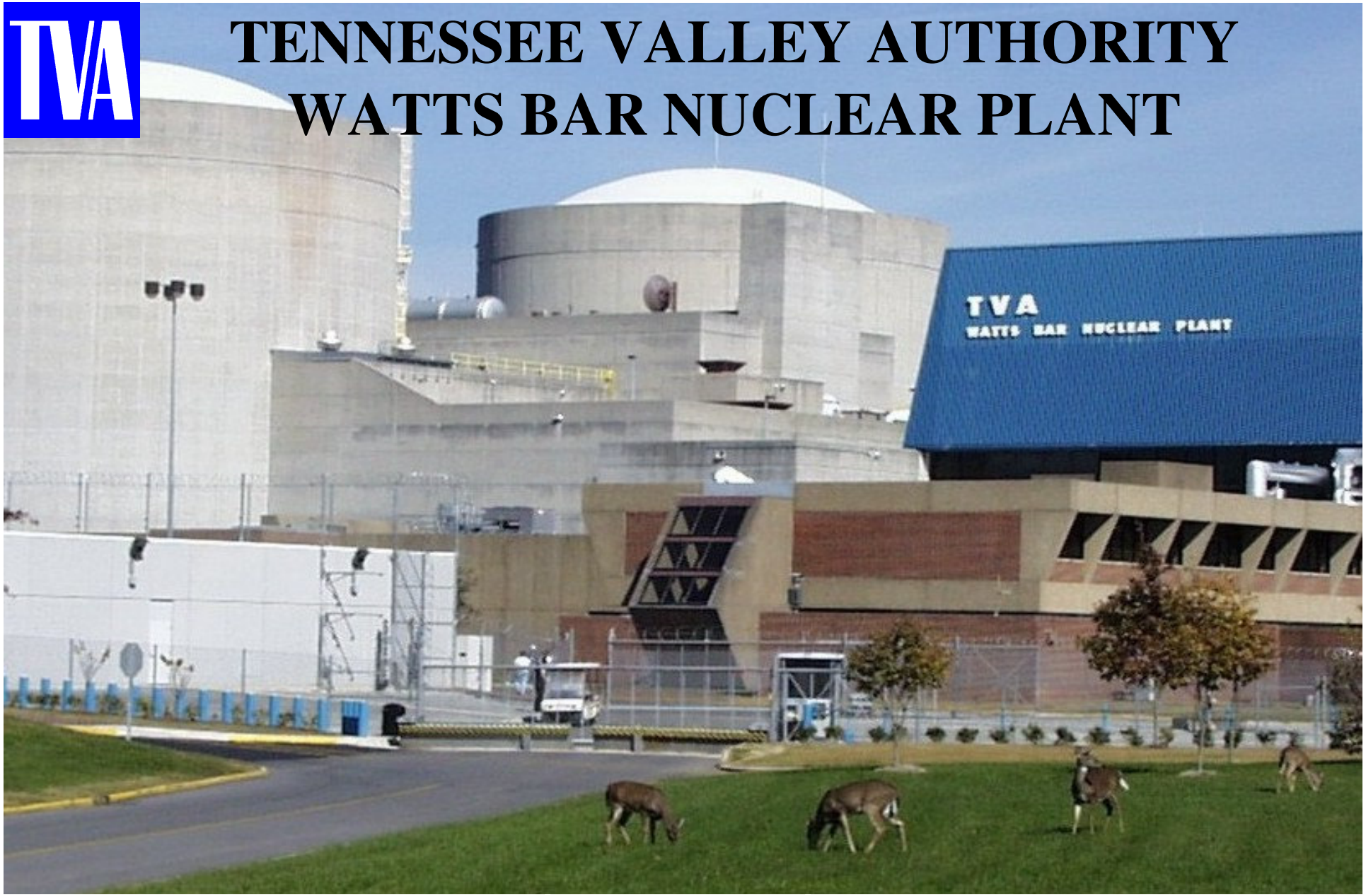
TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT



Masoud Bajestani
WBN 2 Project Vice President

Project History

- May 1971- Application for Construction Permits for WBN Unit 1 and 2 requested
- January 1973 - Construction Permits for WBN Unit 1 and 2 issued
- October 1976 - Application for an Operating License for WBN Units 1 and 2 Requested
  - Opportunity for Hearing
- June 1982 - Safety Evaluation Report for Operating License for WBN Units 1 and 2 (NUREG – 0847) issued
- September 1985 - NRC “Show Cause” Letter to TVA

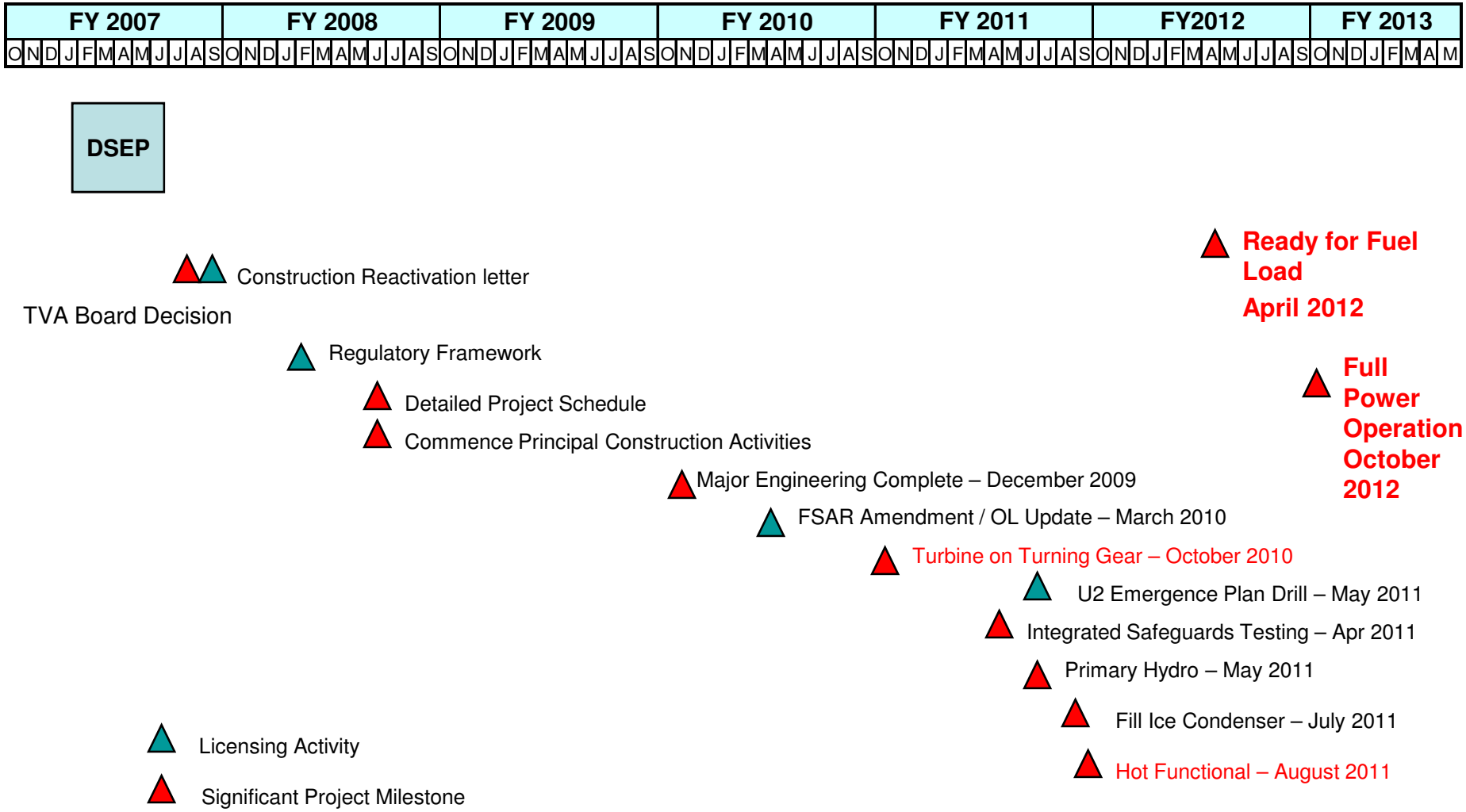
Project History

- Late 1985 - WBN Unit 2 Construction Suspended
- May 1989 - Nuclear Performance Plan (NPP) Describes Actions to Identify and Correct Problems at WBN
- December 1989 - Safety Evaluation Report WBN NPP WBN Unit 1 (NUREG-1232)
- November 1990 - NUREG-0847 Supplement 5 issued
- October 1995 - FSAR Amendment 91 issued
- November 1995 - Low Power Operating License for WBN Unit 1 issued
- February 1996 - Operating License for WBN Unit 1 issued

Project History

- July 2000 - TVA Formally Deferred WBN Unit 2
- January 2007 – Detailed Scoping Estimating Planning Study
- July 2007 - NRC Staff Requirements Memorandum
- August 2007 - TVA Board Approves 5 Year Program for Completion of Construction of WBN Unit 2
- August 2007 - Construction Reactivation Letter
- July 2008 - Construction Permit Extension

WBN Unit 2 Integrated Schedule



WBN Unit 2 Major Contractors

- Bechtel
  - Engineering, Procurement and Construction
- Siemens
  - Turbine/Generator Activities
- Westinghouse
  - NSSS Activities
- Day and Zimmerman NPS
  - Turbine Building Activities

Installation Status

- Major structures complete
- System and component installations are substantially complete
  - Many components “borrowed” by the operating units
- Expect no more than minor degradation of components
- Engineering to complete design, upgrade baseline documents, incorporate key design changes to match operating unit, and complete work on CAPs and special programs

WBN Unit 2 Activities

- Engineering
  - Walkdown packages
  - Calculations
  - Design changes
  - Corrective Action Program work
  - Review of historical documents
- Construction
  - Supports
  - Cable installation
  - Replacement of missing components
  - Refurbishment
  - Turbine upgrades
- Pre-operational Testing

Staffing Projection

- Current project staffing is just over 2000
  - Approximately 525 in Knoxville
  - 1450 at the plant site
- Approximately 1000 +/- craft positions will be added over the next year
- Next year, major engineering work is expected to complete and staffing in Knoxville decrease with some staff moving to the site

Watts Bar Unit 2 Project Status

- Tracking to complete within the 60 month schedule
- Critical path - delivery of key equipment
- Engineering and licensing activities are on schedule
- Bulk work behind schedule because not enough work packages ready for field work
- Staffing levels ramping up this fall
- First system turnovers should be in the first half of 2010

Lessons Learned - Contracts

- Partnering arrangements should be completed prior to awarding a contract to a “lead” company
- Divisions of responsibilities between prime contractors clearly defined
- ASME code relationships between prime contractors designed and established prior to survey
- Include owner options to award work to other companies should performance warrant
- Include clear language defining rework, thresholds for programmatic issues and one time events, and responsibility for correction

Lessons Learned - Processes

- Detailed review of the proposed procedures for all aspects of the project
  - Initiation of specific designs
  - Packaging for construction
  - Procurement
  - Work controls
  - Quality control
  - Generic construction guides
  - Work completion and closure
  - Construction turnover to testing
- Begin at the end to be sure the processes support the documentation required by the license
- Corrective Action Program should be tailored to construction

Lessons Learned – People

- Major companies have generally been relegated to modifications of operating plants, considerably different from new nuclear construction
- Experience levels likely thin at all major players
  - OEM experience in PRA
  - Job planning
  - Supervision
  - Engineering/Field engineering
- Experienced oversight and mentoring
- Training/OJT
- Clear processes
- Owner should perform the pre-operational testing and augment the construction and engineering processes as a developmental tool for plant staffing (system engineers, maintenance personnel, etc)

Lessons Learned – Material

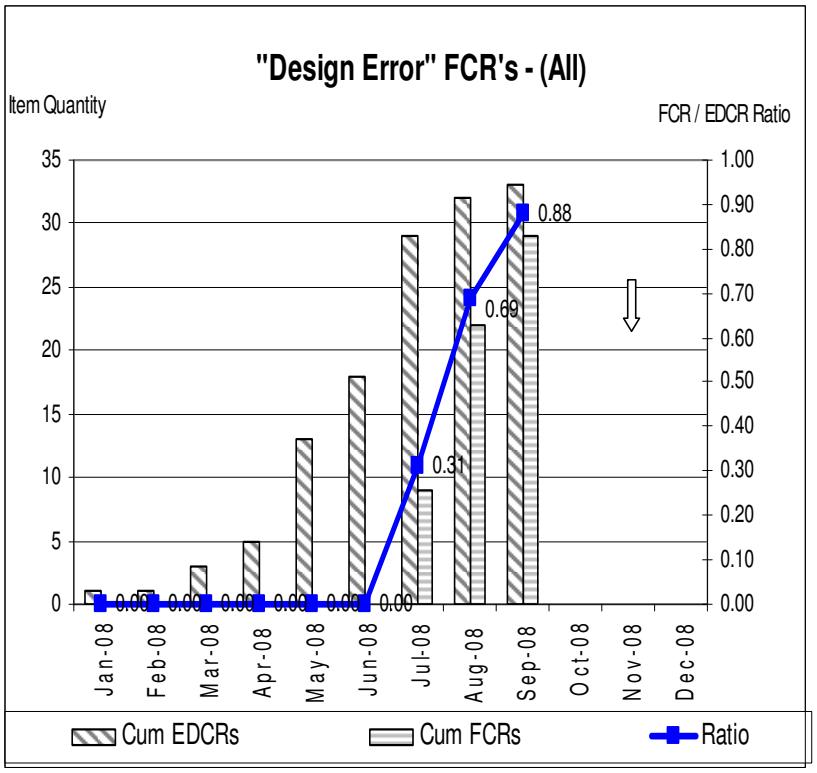
- Supplier choices are more limited than during the original build of nuclear units
- Foreign suppliers for much of the large components
- ASME code suppliers
- Face to face meeting with proposed suppliers with owner oversight
- Supplier quality assurance program reviews prior to award
- Periodic visits during fabrication
- Critical performance tests witnessed by owner

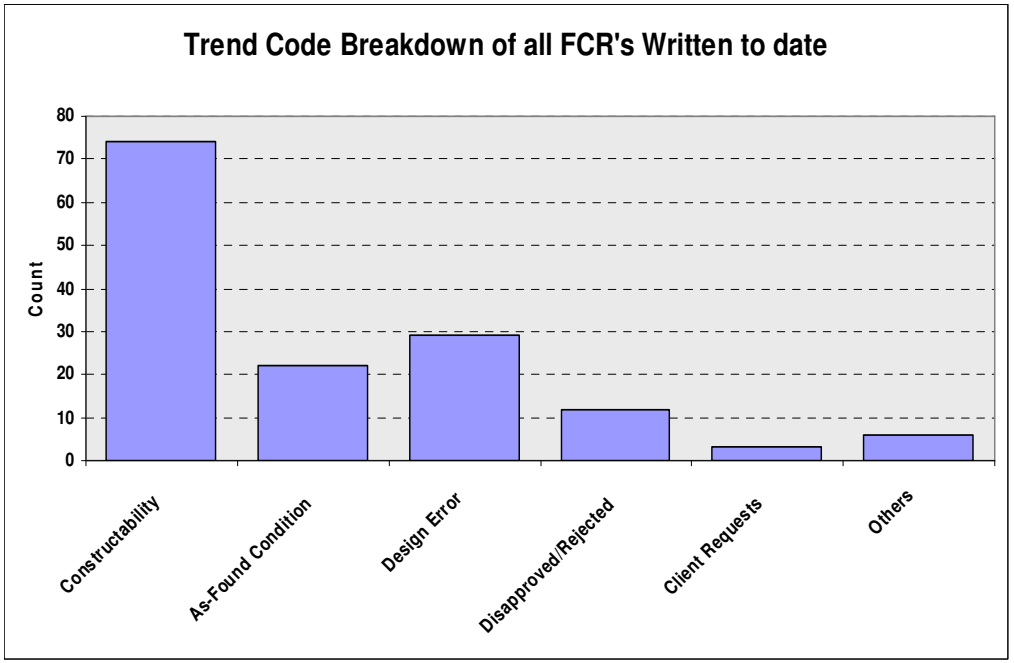
Project Controls

- Owners – Intrude from day 1
- Expect production curves, metrics, schedules for all aspects of the project
- Effective monitoring of cost and schedule performance indices necessary for project success
- Sample curves follow

Project Controls

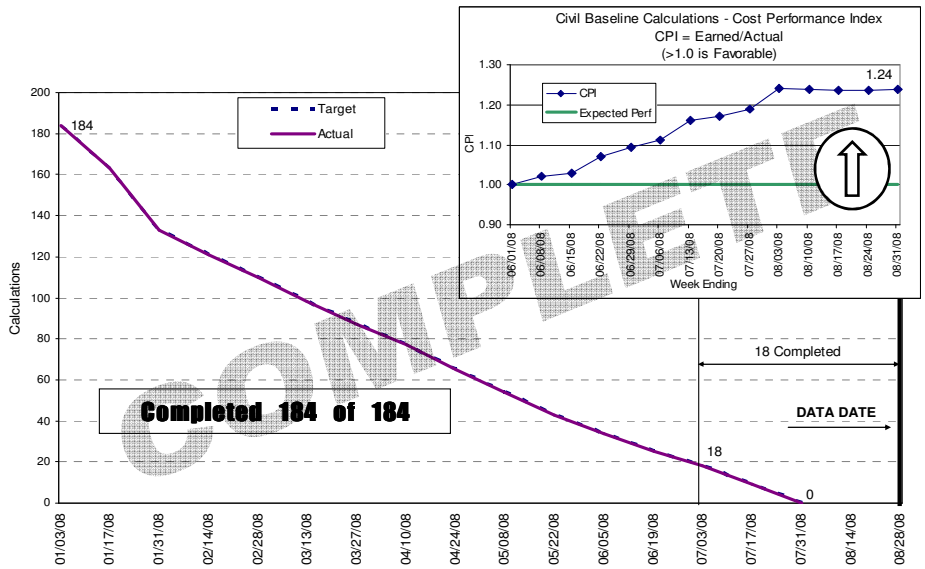
- Some Indicators:



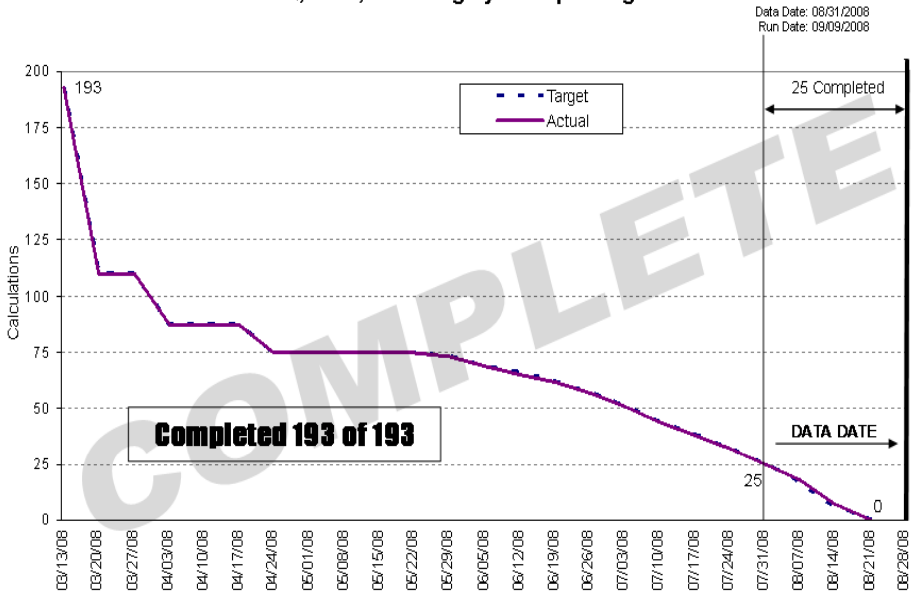


Project Controls

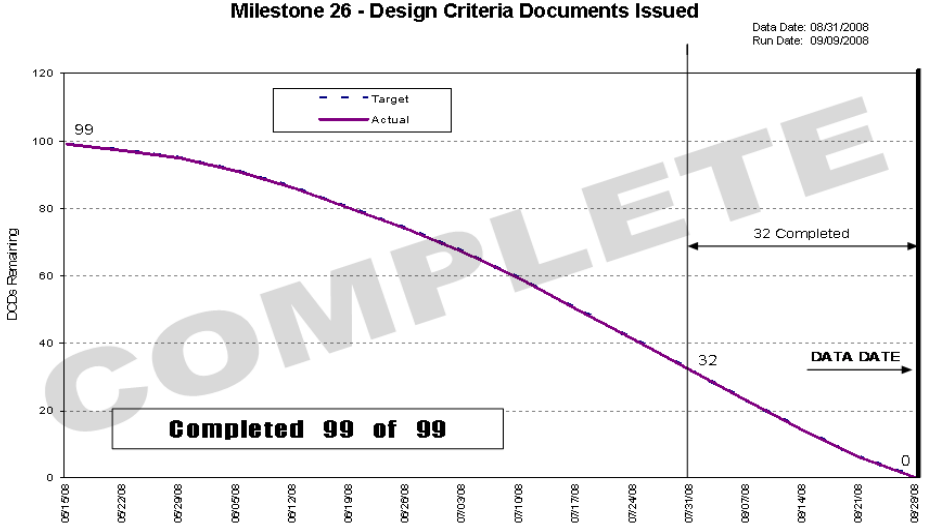
Civil Baseline Calculations



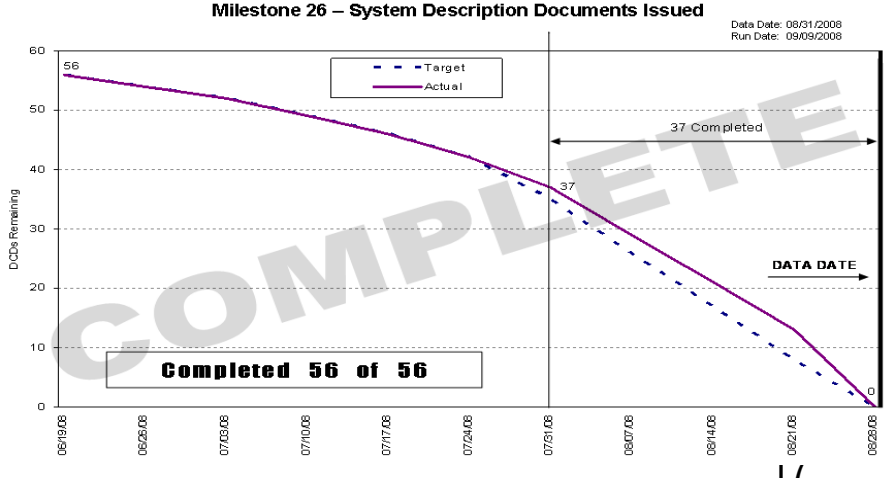
Milestone 26 - EQ, Dose, and Category and Operating Time Calculations



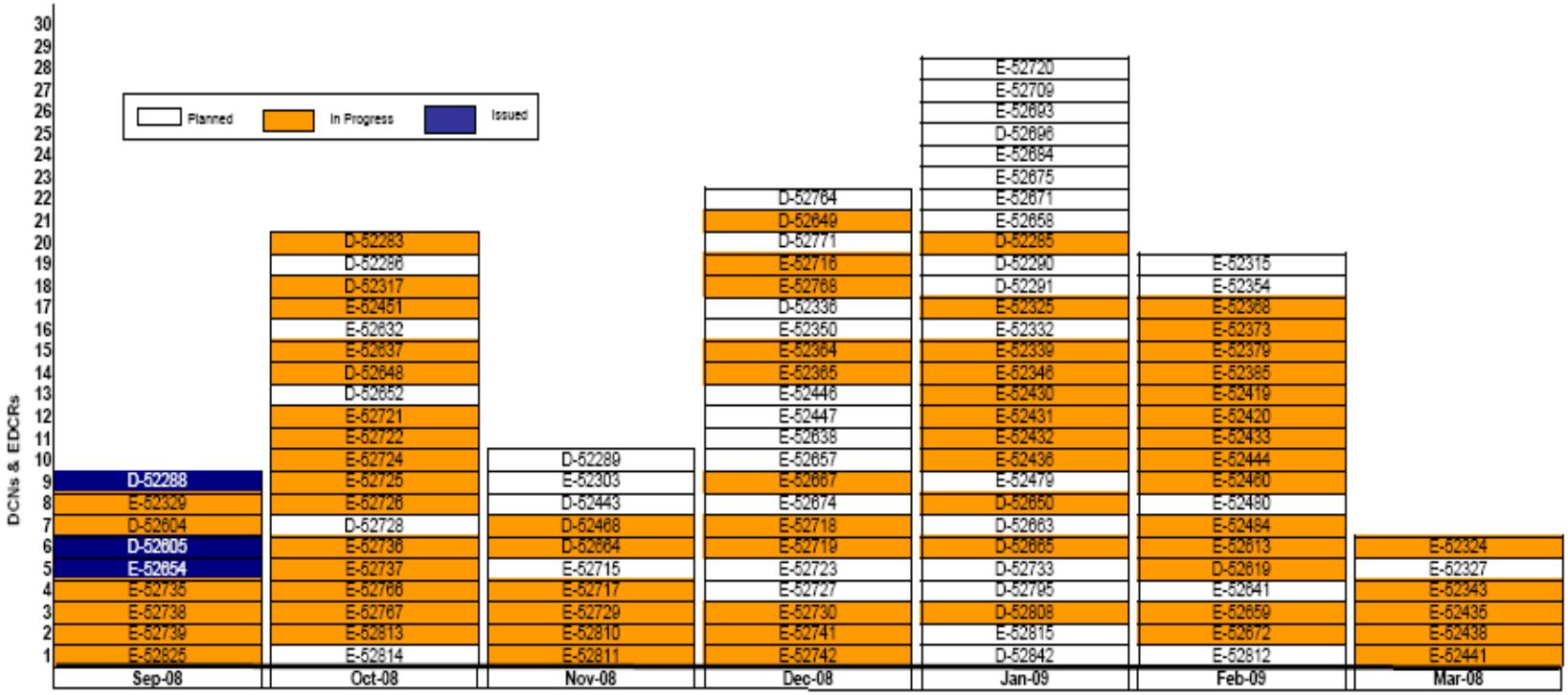
Milestone 26 - Design Criteria Documents Issued



Milestone 26 – System Description Documents Issued



Project Controls



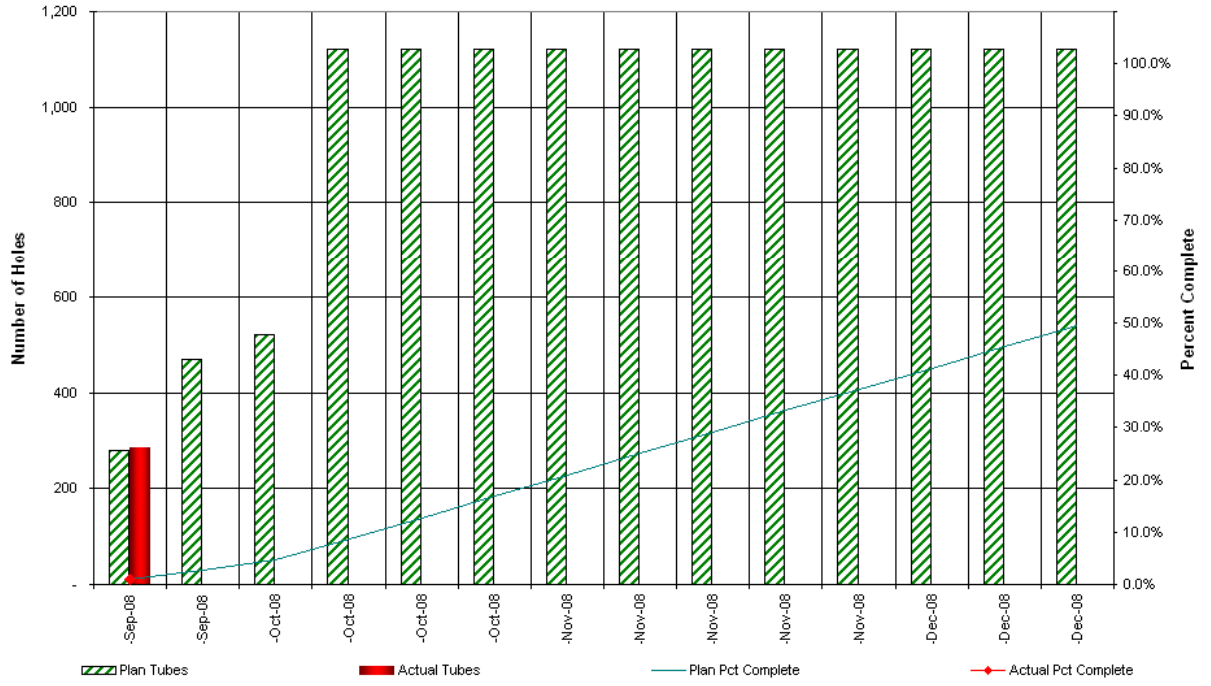
Project Controls

TVA

Job Number: 25402
Job Location: Spring City, TN

Watts Bar Unit 2 Completion
Condenser Tube Installation Curve

Data Date: 23-Sep-08
Run Date: 23-Sep-08



Remarks

Total Planned : **27410**
Actual Thru 22-Sep-08 : **284**

Project Controls

ENGINEERING												PROCUREMENT								
No	DCN/EDCR	System No	QUAL LEV	DESCRIPTION	VENDOR	VENDOR QUOTE No	SHOP SURV.	SHOP EXP.	REQ ON SITE	MR	ISSUE TO PROC.	RECV'D	PA	ISSUE RFQ P/A	BIDS DUE	ISSUE PO P/A	ETA SITE FORECAST	COMMENTS	Engr Forecast Action Comp Date to DC	A/F
266	52736		SR ASME	ASME Valves - *Flowserve*	Flowserve Anderson Greenwood Crosby Henry Pratt	SO 2236 LC-07219-A X3718	Y	Y	*04/16/10*	PV02-00005 R3	10/12/09	2/23/09	RC	~~[illegible] (A)~~ ~~6/1/09 (F) 6/8/09 (F)~~ 6/19/09 (A)	~~4/30/09 (F)~~ 6/12/09 (F) ~~6/22/09 (F)~~ ~~[illegible]~~ ~~7/20/09 (F)~~ ~~7/22/09 (F)~~ ~~7/27/09 (F)~~ ~~8/3/09 (F)~~ 8/3/09 (A)	~~6/7/09 (F)~~ ~~6/20/09 (F)~~ ~~6/29/09 (F)~~ 7/7/09 (F) ~~7/24/09 (F)~~ ~~[illegible]~~ ~~8/10/09 (F)~~ ~~8/18/09 (F)~~ ~~[illegible]~~ ~~9/24/09 (F)~~ ~~10/14/09 (F)~~ 10/21/09 (F) 10/30/09 (F)	24 - 30 Wks ARO	CDS 904 R2, 905 R 2 TO BE ISSUED AND MR NEEDS TO BE REVISED - 6/9 - Revised MR (R2) received in Procurement 8/4 Sent quotes for TBE. MR/TBE Issued on 10/8/09 DC # 782961	~~09/28/2009~~ ~~9/18/09~~ ~~[illegible]~~ 10/8/09	A
314	52614		SR ASME	Leak Test Valves for Ice Condenser System - Enertech			Y	N	*03/22/10*	MRB-PV00-00002	2/6/09	2/6/09	LN	~~03/06/09 (A)~~ 5/2/09 (A)	~~3/27/09 (A)~~ ~~6/16/09 (F)~~ ~~7/14/09 (F)~~ ~~8/17/09 (F)~~ ~~8/18/09 (F)~~ 9/21/09 (A)	~~[illegible]~~ ~~5/13/09 (F)~~ ~~6/26/09 (F)~~ ~~[illegible]~~ ~~8/24/09 (F)~~ ~~10/16/09 (F)~~ 10/28/09 (F) ~~11/18/09 (F)~~ 11/5/09 (F)	28 wks ARO	CDS 906 R1 & MR COMPLETE. MR DC 781132. Need CDS 905 R. 2. Dia. Valve needs testing and pushed MR--test sch 10/2/09 10/6 - test completed and letter received from vendor - dia. Acceptable - MR/TBE revision now required 10/13 - Upon receipt of revised MR, New quote will be requested from Vendor	~~4/18/09~~ 6/12/09 (CDS) ~~4/18/09~~ 10/8/09 ~~[illegible]~~ 12/23/09	A F
314	52614		SR ASME	Check Valves for Ice Condenser System - *Flowserve*	Flowserve		Y	N	03/08/10	MRA-PV00-0002 R3	10/15/09	2/6/09	LN	~~03/06/09 (A)~~ 5/20/09 (F) 5/28/09 (A)	3/27/09 (A) ~~6/10/09 (F)~~ ~~[illegible] (A)~~ 8/25/09 (A)	4/29/09 (F) ~~5/13/09 (F)~~ ~~6/18/09 (F)~~ ~~6/29/09 (F)~~ ~~7/30/09 (F)~~ ~~10/16/09 (F)~~ 10/22/09 (F)	20 wks ARO	CDS 905 R0 & MR COMPLETE. Revised MR received. On hold needs CDS and VDS revision as of 6/23/09. DC # 771412 7/23 - Still waiting on Revised CDS/VDS 8/5 - Rec'd new Quote 9/10 Need revised MRA & TDC to agree with vendor quote. 10/16 issued revised MR/TBE DC # 782978	~~07/14/09~~ 7/17/09 7/30/09 (CDS/VDS) ~~10/8/09~~ ~~12/16/09~~ 12/16/09	A A A
332			SR	AFW Turbine driver/trip & throttle (Terry Turbine) - Reburbishment Inspection Report Only			N		#N/A	MPOG 00001 R2	3/25/09	2/6/09	LN	02/17/09 (A)	03/02/09 (A)	~~7/30/09 (F)~~ ~~8/7/09 (F)~~ ~~8/17/09 (F)~~ ~~10/8/09 (F)~~ 10/14/09 (A)	8 Wks after Receipt of Turbine	[illegible] 8/20 Need revised MR w/Cat ID. 9/25 MR rev completed. DC # 782920 9/30 - Need revised Mail List PO# 10228	~~09/30/2009~~ 9/26/09	A
356			SR ASME	Target Rock Pressure Control Valves PCV-68-334 & 340A	Target Rock	EP08-137 RevA	Y	N	03/31/10	[illegible] R2	10/9/09	2/6/09	DV	~~02/18/09 (A)~~ 6/4/09 (A)	~~[illegible] (A)~~ ~~6/18/09 (F)~~ ~~6/23/09 (A)~~ 8/4/09 (A)	~~4/17/09 (F)~~ ~~4/20/09 (F)~~ 6/12/09 (F) ~~6/10/09 (F)~~ ~~[illegible]~~ ~~6/30/09 (F)~~ ~~7/8/09 (F) 9/3/09 (F)~~ ~~9/17/09 (F)~~ ~~10/8/09 (F)~~ 10/19/09 (F)	4/26/10	6/2 - Revised RFQ issued based on receipt of revised CDS & MR 6/23 - Received one quote two add'l quotes due this week. 7/7 - Quote [illegible] to engr for evaluation 7/9 bid rec'd from Target. Two add'l bidders (Valcor & Valve Tech) to quote by 7/17 7/17 - Engr to respond to Valtech questions; Dresser initially noted that they would not quote, now informed that they will provide quote in 1-2 wks, buyer advising Dresser that quote is required in 1 week 7/22 - Dresser advised they will not bid & that Target Rock is best fit. 8/4 Rec'd quote from Valcor Eng 8/5 - Quote to Engr for Evaluation 9/10 Got info from Valcor to Engr that Valcor can't quote. 9/14 buyer out for re-quote 9/16 Requested Quote validity & improvement in Del date, From Target Rock 9/23 Issue with valve length - old valve which has been removed is no longer made. Engr working with vendor on valve lenght to fit piping system existing 9/29 Target Rock to met with Eng at WBN to discuss options 10/1 Engr preparing TBE as a result of the Target Rock Meeting	~~4/28/09~~ ~~[illegible]~~ 10/2/09	A
364			SR ASME	Feed Pump Bypass Check Valves (Internals in Hut) CKV-3-638 & 644	Flowserve		Y	N	#N/A	PV01-00001 R1	10/9/09	1/29/09	LN	~~[illegible] (A)~~ 10/14/09 (A) Requote	~~[illegible] (A)~~ 10/28/09 (F) Requote	~~7/29/09 (F)~~ ~~8/26/09 (F)~~ ~~[illegible] (A)~~ 11/09/09 (F)	4/4/10	5/15 - HDTR issued by Site Engr for valve in HUT 29. Reviewing with Engr for status and if MR to be cancelled due to valve available in Hut 29. Review completed. Will purchase via MR, no valve in HUT 29. 6/23 - Engr to review Flowserve original quote, issue revised MR, of flowserve proposed alternate valve. Requested valve no longer manufactured. 7/7 - TDC received from engr - engineer rejected quote and returned to Procurement for re-bid. 7/23 - Need Revised MR/CDS/VDS due to valve being obsolete - alternate needed. 10/2 DC #782945	~~[illegible]~~ 7/8/09 (TBE) 8/21/09 (MR/CDS/VDS) ~~9/18/09~~ ~~10/4/09~~ 10/2/09	A A
440	52780	67	SR ASME	Check, globe, gate valves - *Flowserve*	Flowserve	SO-2116	Y	Y	05/12/10	PV01-00002 R2	5/25/09	3/17/09	RC	~~4/7/09 (A)~~ ~~5/20/09 (F)~~ ~~6/1/09 (F)~~ 5/25/09 (A)	~~4/30/09 (F)~~ ~~4/27/09 (F)~~ ~~[illegible] (A)~~ ~~6/10/09 (F)~~ 6/22/09 (A)	~~4/20/09 (F)~~ ~~6/11/09 (F)~~ ~~6/18/09 (F)~~ ~~6/29/09 (F)~~ ~~7/8/09 (F)~~ ~~8/26/09 (F)~~ ~~9/30/09 (F)~~ ~~10/13/09 (F)~~ 10/27/09 (F)	24 Wks ARO	6/23 - Quotes to Engr for evaluation 9/10 Request requote from Flowserve for MR Line Item #1 9/17 Quote due 9/22. *9/21 quote Issued to Scott Fesler.* DC# 782927 9/28 Revised MR & TBE rec'd 9/29 Awaiting acceptance from Flowserve for Items 1 & 2; Issued RFQ for MR Line Item 3-due 10/16 10/6 Quote for Item 3 to Eng; Need revised data sheet, CDS Revision/MR Revision for Item 2	~~08/21/2009~~ ~~9/18/09~~ 9/26/09 12/23/09	A F

Closing Thoughts

- On line, on time, on budget is achievable provided everyone is prepared and is paying attention
- Experience levels for craft, engineers, management is thin for new nuclear construction
- Material suppliers are still “gearing up”
- Don’t underestimate ASME certificate acquisition process
- Owner should be involved and intrusive in the daily and big picture plans

Questions

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